REDESIGN OF THE CURRENCY

Y 4.B 22/1:103-154

Redesign of the Currency, Serial No...

HEARING

BEFORE THE

COMMITTEE ON BANKING, FINANCE AND URBAN AFFAIRS HOUSE OF REPRESENTATIVES

ONE HUNDRED THIRD CONGRESS

SECOND SESSION

JULY 13, 1994

Printed for the use of the Committee on Banking, Finance and Urban Affairs

Serial No. 103–154

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REDESIGN OF THE CURRENCY

WEDNESDAY, JULY 13, 1994

HOUSE OF REPRESENTATIVES,
COMMITTEE ON BANKING, FINANCE AND URBAN AFFAIRS,
Washington, DC.

The committee met, pursuant to notice, at 10 a.m., in room 2123, Rayburn House Office Building, Hon. Henry B. Gonzalez [chairman of the committee] presiding.

Present: Chairman Gonzalez, Representatives LaFalce, Vento, Frank, Kennedy, Waters, Klein, Deutsch, Barrett, Watt, Klink, Leach, McCollum, Roth, McCandless, and Lazio.

The CHAIRMAN. The committee will please come to order.

At the outset, let me thank all of the witnesses for having very promptly responded to our invitation. This is a very important issue. The remarks of the witnesses will be very relevant to a problem that we have been advised of at least for 3 years, and that we had tried to do something about.

Unfortunately, I wanted to explain that this morning, the House is meeting at 10 o'clock, and apparently a decision has been made to have a legislative procedural vote. I am sure that this vote is what we call on the *Journal*, and I am sure that is one reason why some of the members decided to go take the vote and then appear here. So in order to expedite matters, though, I will ask your indulgence to allow me to go register my vote and come back immediately.

So I apologize for this interruption, but I will be back as soon as possible.

[Recess.]

The CHAIRMAN. The committee will please come to order.

The purpose of this hearing this morning is to discuss one of the most underrated, yet important, issues facing our financial future, the well-being of our currency, its physical well-being.

I am afraid the other aspect which in all fairness to myself, I have been speaking on for 20 years or more, unfortunately, doesn't bode good for us, and that is the value of the currency. Today, we are working with a 10-cent dollar, and that can't be good for anybody.

As the world's predominant medium of exchange and store of value, the resiliency of the dollar is constantly challenged, and is frequently under attack from dubious forces such as counterfeiters and money launderers. We must protect the dollar's standard as the world's foremost currency. Our financial future depends upon it.

To illustrate the dangers of neglect, imagine a scenario whereby the U.S. dollar's value is undermined by large-scale counterfeiting, and there is a surge of demand for deutsche marks or yen. Our Nation's coffers would soon empty as we tried to purchase enough foreign currencies to satisfy our massive external debt. In short, the United States would be bankrupt. Many experts believe the U.S. dollar is in no imminent danger.

However, in international trade, the dollar continues to lose ground to the yen and the deutsche mark. Again, to repeat, as I have been noting since the 1970's, it is all in the record; it is what I am saying now. In fact, since 1985, the dollar has lost well over 50 percent, actually this should be later than 1985. For since the early 1980's, certainly, the middle 1980's, the value of the dollar has slipped two-thirds—it has lost two-thirds of its value against both the yen and the deutsche mark.

When you try to translate this to what it means, it is very difficult, and this is where the trouble stems, and therefore, the danger is not perceived. In fact, just within the last 2 years, the loss of value against the yen has taken a similar fall against the deutsche mark. And we have to be more vigilant in protecting the currency.

A vital means of protecting our currency is to adopt a worldwide anticounterfeiting program. For years I have championed efforts to improve the relatively simplistic design of the Federal Reserve note to stay ahead of the new technology available to counterfeiters. It was 32 years ago that a relatively minor, even though he was quite an artist in the Engraving Bureau, asked to see me very confidentially, and he expressed his great concern that the United States was going to purchase the printing presses in Germany, West Germany at that time. But what he feared most was the reduction in the net integrity of the material, the paper. And he predicted counterfeiting; and he was so nervous.

I had to hold everything in confidentiality, but I did raise issues and questions. I have been a member of the subcommittee which used to be called Consumer Affairs and Coinage since I came to the Congress. And so I then prevailed on the then-chairlady to try to call a session, but it wasn't—again, there wasn't much concern. However, what he said turned out to be true, and verifiable. And you did have the Secret Service a few years later concerned about the increased velocity in the pattern of counterfeiting. So my interest stems that long.

And then 3 years ago we were informed and we held it, as we were asked to in confidentiality until a few months after that it was obvious that our source had also given that out to others and it was publicized mostly in Europe where the $100 bill was raising quite a bit of concern. So we then contacted the then-Secretary of the Treasury, and I was told that there would be no attempt to try to protect the integrity of the note of the $100, either through any contemplated design change or what have you. So I want to compliment this administration for immediately assuming that responsibility, and I sincerely compliment you.

Then-Secretary of the Treasury Nicholas Brady turned down the committee's request to initiate more dramatic anticounterfeiting efforts to increase the security of the currency. Since that request,

the counterfeiting of U.S. currency abroad has increased fourfold. Today, we will hear how the initiatives adopted by the Clinton administration will protect the greenback.

At a minimum, changes in the design of the currency must provide practical deterrents against both current and possible future counterfeiting schemes. And I repeat, I applaud the Department of the Treasury for adopting changes in the design of the U.S. currency to include more sophisticated counterfeiting deterrent features.

In addition to the Treasury action in redesigning our currency, the Federal Reserve must do more research on where and why our currency is held overseas. The Federal Reserve now estimates that 60 percent of our currency is held overseas. They do not have precise statistics to show where it is held and how it flows through the arteries of our international financial system. More needs to be done to understand these factors.

There is also a dearth of information on how the massive foreign holdings of our currency affects monetary policy. As we have witnessed in the past several months, if people lose faith in the dollar, certainly, our monetary policy will be affected.

Yet, the Federal Reserve denies any strong link between foreign currency holdings and monetary policy. Surely, that is a dangerous position, and I will continue to urge the Federal Reserve to learn more about the whys and wheres of the overseas holdings of the dollar.

I look forward to hearing from today's witnesses, and again, I repeat my thanks for your great help.

And I recognize Mr. Leach.

Mr. LEACH. Well, thank you, Mr. Chairman.

I am pleased that the administration is finally prepared to come forth with its proposals. I understand that they are going to be significant. Obviously, a redesign of currency carries certain pitfalls. A country becomes comfortable with precisely what it has. The last redesign was 1929. It was of a major nature. People should understand that Interpol also resulted at the same time because it was viewed as an international problem.

Confidence in the currency is clearly a part of the lifeblood of commerce, although a lot of commerce is carried on without currency. But the fact is counterfeiting is growing and techniques in counterfeiting are becoming more readily available to more people.

It appears it is particularly a large international problem and possibly particularly large in one region of the world, the Middle East. We have no choice but to respond.

There is a lot of bipartisan interest in this issue. The minority has introduced legislation to encourage part of what apparently is going to be announced today. But I would also stress the minority has never been convinced that the government has viewed the issue of counterfeiting as a high enough national security concern. Part of the bill the minority has introduced stresess the ramifications for foreign countries that knowingly and willingly allow or indeed authorize the counterfeiting of our currency. I think this attendant international legal issue is something that has to be addressed with the redesign of the currency.

I thank you, Mr. Chairman.

The CHAIRMAN. Thank you very much. I was going to request for the sake of time and since we are in session and liable to get interrupted again, that any member really strongly desiring to be heard at this point I will recognize for about 2 minutes. Otherwise, submit your opening statements for the record. Well, I am going to go to this side.

Mr. VENTO. Mr. Chairman, I will just take a minute. I want to respect that the witnesses are here. I think that in the noncash economy that we deal in, there is a lot of concerns about illegal use and the currency is playing a smaller role, I guess, in the general circulation of payment and debts in our economy, but nevertheless it is important to—I think that many sort of nostalgic notions about our currency and we just cannot afford those romantic notions.

We need to be in step with this. I think we need to be progressive. I note last time I voted to take the eagle off of the coin someone said, and so that was—I checked it out, though, and it is not eligible for the Endangered Species Act now, so we have taken it off of the Endangered Species Act.

I think the concern here is we need to be cooperative. It is the major responsibility of the Congress in terms of currency, and I think the concern is the old adage that crime shouldn't pay, especially if you print your own money. Mr. Chairman, this is something we need to be attentive to and to various—I want to associate myself with the remarks that you made concerning the foreign currency and what the implications are.

But I think we really ought to move forward and get out of sort of the mentality of collectors and so forth and do what is necessary to properly use, and for this to fulfill its goal. So I hope we will have an open, progressive move here to act on this and to deal with it in a comprehensive and competent manner, not associated with politics and the sort of nostalgic notions that surround currency.

Thank you, Mr. Chairman, for holding the hearing.

The CHAIRMAN. Thank you. Mr. McCandless—pardon me. Mr. Roth.

Mr. MCCANDLESS. Mr. Roth came in after I did, Mr. Chairman.

The CHAIRMAN. Oh, he did, OK. Well, it is among you. I won't ask Mr. Leach to referee this one.

Mr. MCCANDLESS. Well, Mr. Chairman, we have changed the schedule on the floor and I wanted to get my word in, because we are going back to the desert plan.

The CHAIRMAN. Oh, still in the desert?

Mr. MCCANDLESS. Yes, still in the desert.

The CHAIRMAN. Oh, good heavens.

Mr. MCCANDLESS. Still have sand in my shoes, Mr. Chairman.

I wanted to talk about another aspect of this, because this came to my attention during the inclusion of the vertical polyester ribbon scenario a few years back which the chairman referred to. In my community of retirees of which there are a large number—Sun City, those names are very familiar to people, we have two of those, and many other types of a similar nature—there is a real fear on the part of these people who live on fixed incomes that any change in the currency is a design, a grand scheme to devaluate the currency at some point in the future, and that once this currency has

been published or printed in numbers necessary, that the next step in this grand scheme will take place.

I mention this, Mr. Chairman, and members of the panel, because I think it is extremely important to not only that type of person who lives on an income and has a lot of time to think about these things, but others, that as you move forward in whatever steps you may take, that you bring the rest of the population along to the degree possible, that they understand the real reason for this and that there isn't some type of an underlying activity of which this happens to be the first phase. This is so important because of the number of letters that I and others get with respect to changing the currency. If we did nothing but say count the mail at that time, we were probably getting somewhere around 300 letters a week, which we have to answer, obviously, that this was not a scheme that the polyester ribbon was for the purposes of identifying the real against the counterfeit.

The second point I would like to make is I am still in the process of showing people at locations where money is handled and handled in some cases in large amounts, the difference between a $100 bill with the polyester ribbon, which is legal tender, and what it would be without that polyester ribbon, which indicates to me that there is a job necessary on the part of those of you who are involved to educate the public and those who handle money in large degrees or moderate degrees, that here is a difference between the $100 bill, and I understand we are down to the $50 and we are working on the $20, if I have my facts correct, and to take a minute and hold it up to the light or look at it as a means of encouraging or discouraging the counterfeiting aspect and the passing of that counterfeiting money.

These two points are very important to those people out on the street who actually are the possessors of this currency and the notes and the backing that this currency represents.

Thank you, Mr. Chairman.

The CHAIRMAN. Mr. Kennedy.

Mr. KENNEDY. Thank you, Mr. Chairman, for holding this morning's important hearing. You have certainly been one of the country's leaders in pointing out the dangers of counterfeiting and the need for our government to take stronger steps to combat it.

Counterfeiting is a serious and growing threat to the stability of our currency. From 1988 to 1993, Secret Service seizures of phoney money fell from $110 million to $24 million. But during that same period, the amount of counterfeit money found in public circulation almost doubled from $11 million to $19 million.

In large part, these rises in counterfeiting are due to the growing aggressiveness and sophistication of counterfeiters. They are coming up with fake notes that look more and more like the real thing. One band of Lebanese terrorists have put over 1 billion dollars' worth of counterfeit dollars into the market that the Secret Service says are close to perfect forgeries.

Unfortunately, our government has done too little to stop the threat of counterfeiting. Our currency has not only been significantly changed—since the 1920's, and a couple of years ago the Treasury Department added the polyester thread to the bill. But

the feature has also been easily copied and evaded. Clearly, more must be done to protect our currency from counterfeiting.

I am pleased that the Treasury is here this morning to unveil its most recent proposal. If news reports are true, then I think that Secretary Newman's testimony will mark real progress in the fight against currency fraud. Any counterfeiting features such as light-sensitive water marks, holograms and holographic threads, and the use of multicolored inks that resist copying can go a long way toward putting them out of business.

One thing is certain, however, that today's solution is tomorrow's problem. Counterfeiters will continue to find ways to crack new safety features. So we must continue to be innovative in order to keep one step ahead of counterfeiters. We can't fundamentally re-evaluate the currency once every 65 years.

The only caution that I would have about the issue in general is I think that given some of the difficulties that the dollar is facing on the international market these days, I am concerned that if we go into a wholesale redesign of the dollar at this time, that it can maybe send out a message that is not necessarily the stable one that the Federal Government wants to be sending about the value of the dollar, and so I think that my inclination is to try and keep the dollar as close to the design that we have today, rather than come up with a whole new redesign of the dollar bill, you know, whether George Washington's head is on the right side or the left side of the dollar or however you guys can come up with this thing.

My own instinct tells me that the thing has worked well for a couple hundred years and I would probably leave that machine going the way it is.

Anyway, thank you very much, Mr. Chairman, and I appreciate it and look forward to the testimony.

The CHAIRMAN. Mr. Roth.

Mr. ROTH. Thank you, Mr. Chairman. I want to compliment you for having this hearing today.

There are published reports and rumors of large scale counterfeiting, particularly abroad, and I think it is very important that we look at it. If we do change our money, Mr. Chairman, I certainly hope we don't take "In God We Trust" off of our money, as has been proposed by some.

Mr. Chairman, in accordance with your wishes, I will keep my comments brief. I would just like to add this. I do have a number of questions that I would like to submit to some of our witnesses, if that meets with your approval, I would like to do that.

Thank you, Mr. Chairman.

[The questions referred to can be found in the appendix.]

The CHAIRMAN. Thank you, sir.

Mr. Klein.

Mr. KLEIN. Mr. Chairman, first of all, I would like to thank you for holding this hearing and for your leadership on the issue of counterfeiting. In the spirit of brevity that you have suggested, I would simply say that, as previous speakers have noted, counterfeiting both in this country and abroad is clearly a major problem. Indeed, it is part of a much larger problem, the problem of currency abuse which includes money laundering and so many other things, which contribute to the support of crime which adversely affects

our ability to collect revenues, and indeed, I think have an adverse effect on the stability of the dollar.

So I commend the administration, the Treasury Department, and the Bureau of Printing and Engraving for its leadership in suggesting ways to deter counterfeiting, and I look forward to seeing the new design, because I share Mr. Kennedy's views that whatever the design may be, it should be specifically focused on preventing counterfeiting and not result in a dramatic change which might in any way result in some concern on the part of the American public or people abroad about the stability of the American dollar. I, for one, feel that the American dollar is "sound as a dollar," to use a phrase, and I think we ought to get that word out.

The CHAIRMAN. Thank you, sir. Mr. McCollum.

Mr. MCCOLLUM. Thank you, Mr. Chairman. I want to again thank you for having this hearing on the redesign of the dollar and the problem we are having with counterfeiting. I have been involved with this issue, as some in the room know, since it came to the attention of our Task Force on Terrorism and Unconventional Warfare which I chaired a couple of years ago, back in 1992, to be precise, that we had some tremendous problems with counterfeiting of the $100 bills emanating primarily from the Middle East with the aid of Iran and Syria.

I have in my pocket today a $100 bill which is a real one, as I understand it. This $100 bill has markings on it etched into it by every handler of it to assure since it came from Lebanon and went through traffic over there that it is real. That is the way they treat it.

My understanding is that it takes $1 in real American currency to get this $100 bill, because it is real, and there are so many fake ones in that part of the world. It is terrible and tragic that America would have a situation where our $100 bills are in such demand, the real ones, that you have to pay that kind of premium to get one of them and be treated like a note.

I thank you for having the hearing today and I look forward to questioning the Treasury and I appreciate their great interest in this, which I think is very welcome.

Thank you, Mr. Chairman.

The CHAIRMAN. Thank you, Mr. McCollum.

Ms. Waters, do you have an opening statement?

Ms. WATERS. Mr. Chairman, I have no opening statement. I am looking forward to hearing the witnesses if we can ever get to them.

The CHAIRMAN. Thank you very much.

Ms. Waters indicated she didn't have an opening statement, so we will proceed.

Our first leadoff witness is the Honorable Frank R. Newman, the Under Secretary for Domestic Finance for the Department of the Treasury.

STATEMENT OF HON. FRANK N. NEWMAN, UNDER SECRETARY FOR DOMESTIC FINANCE, DEPARTMENT OF THE TREASURY

Mr. NEWMAN. Thank you, Mr. Chairman. Good morning, members of the committee. I am genuinely pleased to be here today to

discuss the Treasury's plan for promoting the security of U.S. currency into the future.

With me from Treasury are Mary Ellen Withrow, Treasurer of the United States; Peter H. Daly, Director of the Bureau of Engraving and Printing; Guy Caputo, Deputy Director of the U.S. Secret Service; Tom Ferguson who has been working with Mr. Daly on the new currency design; as well as Governor Edward Kelley of the Federal Reserve.

At Secretary Bentsen's direction, I serve as chairman of what is called the Interagency Advanced Counterfeit Deterrence Steering Committee, which is composed of the Treasury Bureau represented here today and the Federal Reserve.

The committee has actually been operating since 1982 to work on programs to assure effective cooperation among the parts of the government responsible for stewardship of our currency system. Last year, Secretary Bentsen charged our committee with prompt analysis of trends and alternatives for responsible action by the Treasury Department. This morning, Secretary Bentsen announced that the Treasury Department is undertaking a comprehensive program to modernize the design of U.S. currency. We are here today to outline the rationale, objectives, and approach to that program, and to respond to your questions about it.

First, Mr. Chairman, I would like to express our appreciation for your leadership on this issue in recent years. Your support has been most valuable as we have developed programs to protect our currency from future counterfeiting threats.

As you know, the dollar is a de facto world currency. About two-thirds of the roughly $350 billion of U.S. dollar currency in general circulation is being used outside of the United States. This reaps economic benefits to the United States because this interest-free currency source of funding issued by the Federal Reserve supports a corresponding level of interest-earning assets. Most of the Federal Reserve's annual interest income is then paid to the Treasury. As Governor Kelley will explain in more detail, this value has been running in excess of $15 billion a year for the U.S. Treasury.

In other words, when people buy U.S. notes, from the Federal Reserve, they are providing funding to our country without being paid interest. The Federal Reserve uses those funds to invest in U.S. Treasury securities, which are a source of interest income on the order of $15 billion a year that is applied to the funding for the United States.

Because of the size of the U.S. economy and the dollar's worldwide acceptability, the dollar will always be a target of counterfeiters. At this time, however, counterfeiting does not pose a significant threat to our economic well-being or our monetary system. The amount of counterfeit currency passed in the United States each year has been running less than one one-hundredth of 1 percent of the currency in circulation, and the diligent efforts of the Secret Service have meant that most counterfeit bills are never even passed to the public.

Nevertheless, as advanced computer-based reprographic technologies continue to evolve, the deterrent features of our current currency will become increasingly less effective. As a result, we must take steps now in order to address a threat that will increase

as technology improves. That is what this program is all about—attacking the future technological threat before it fully evolves.

Secretary Bentsen has authorized the final development and testing of a set of new counterfeit deterrent features that will significantly increase our currency's defense against reprographic technologies. These features have been taken from an inventory studied by the National Academy of Science and augmented with research by the Bureau of Engraving and Printing.

Furthermore, the Bureau studied the currencies of other countries, not only for an assessment of their security features, but also for insights into their production and circulation requirements. A number of other countries around the world have taken steps to add technological features to their currency to combat counterfeiting.

The insights from these discussions were helpful for our development program. The special large-scale production and circulation characteristics of U.S. currency made the implementation of certain features used in other countries impractical for the United States. However, our new design incorporates a number of the most advanced and effective technologies used anywhere in the world.

The new features authorized for testing and development include changes in the paper, ink, and design of our currency notes. Major among them are an enlarged off-center portrait of each denomination, a matching watermark, an enhanced security thread, and microprinting in the design and on planchettes embedded in the paper. There are also interactive patterns which turn into irregular, wavy, so-called moire patterns when copied by existing copying machines.

In addition, a variety of covert but machine-readable features will be added for banking system use and for use by the Federal Reserve System. We expect a production design to be finalized in 1995, and we should be ready to issue new design $100 bills about a year later. Peter Daly and Tom Ferguson from the Bureau of Engraving and Printing will present the features and plan in more detail.

We would like to call your attention to several points concerning the security aspects of this program.

The program is an orderly, preemptive plan to protect U.S. currency from counterfeiting which could be facilitated by advancing technology.

The new design features work in synergy, as a system. This is particularly important. No single feature alone can provide enough counterfeit deterrence to withstand the technological threats we expect will develop in the future.

Because the technology available for counterfeiting is evolving, no longer will U.S. currency be as static in design as it has been. Therefore, elasticity must be built in now to accommodate the inclusion of new deterrents and the discontinuance of those that lose their effectiveness as the paths of technology develop.

In other words, this change will not be the last change in your currency. We are living now in an age of rapidly changing technology and we will need to incorporate new changes in our currency from time to time as the technology develops.

The combination of overt features will augment the ability of merchants and the public to more readily identify genuine notes, thereby strengthening our frontline defense against counterfeiting. At the same time, the covert features will aid Federal Reserve processing and add another level of security.

We believe the plan is cost-effective and is not disruptive to existing cash processing system or worldwide use of the dollar.

The plan is not a response to a crisis. It is not a response to any current counterfeiting case. It is a responsible, forward-looking, preventive program.

It is clearly in the best economic and political interest of the United States to have a freely circulating currency relied upon everywhere as a symbol of strength and trustworthy medium of value. However, it also makes our currency a prime candidate for illicit use and a favorite target for counterfeiters. Despite this, world confidence in U.S. currency remains extremely high, and as undesirable and as serious as counterfeiting is, it does not now pose a serious problem for our currency system.

However, there are no absolutely counterfeit-proof documents, and there will undoubtedly be continuing attempts to counterfeit U.S. dollars with the use of modern technology. We need to strive to stay ahead of that curve with high security currency features. The proposed features necessitate some design changes, but the traditional look of U.S. currency will be largely maintained. The size, national symbols, and colors will be the same as they are now.

We are following the philosophy that was suggested by Mr. Kennedy and Mr. Klein a little while ago. Basically, we are making those changes that are necessary to incorporate the security features that we think are most effective and most meaningful, and not making additional changes.

Let me just repeat: The sizes of the bills will remain the same, the national symbols will remain the same, the historical figures who are pictured on the bills will remain the same, and the colors will remain the same as they are right now.

Before concluding, I should touch on some approaches that were explicitly and unanimously rejected by our committee and by Secretary Bentsen. There have been some suggestions that perhaps the United States should demonetize and recall its existing currency and issue a new one. The objective of that approach presumably would be to flush out hordes of cash and disrupt various money laundering methods associated with tax evasion and drug trade. Other suggestions have been made for separate domestic and international versions of U.S. currency.

Our committee considered these ideas and concluded that they are not viable options and would be overreactions to the situation as we know it. The United States has never recalled or demonetized any of its currency and will not do so now. Again, I will repeat. The United States has never recalled or demonetized any of its currency and will not do so now. Such an act would touch on highly sensitive international issues and work against the larger economic interests of the United States by disrupting the beneficial world reliance on the dollar.

We do recognize that since existing currency will continue to be valid, we need to continue counterfeit detection and enforcement

programs with them in mind. The Secret Service has an outstanding record in this regard, and Mr. Caputo will explain more about that ongoing program. In addition, the Federal Reserve will continue to destroy older bills that pass through the banking system, so that, over time, the vast majority of bills in use will be of the new design.

Treasury believes that the necessary strengthening of the security of our currency can be achieved in an orderly way over the next several years with the introduction of a new generation of currency. This will keep us ahead of the technological curve, add important assurance for the integrity of our currency domestically, and help assure that the dollar will continue as a currency of choice around the world.

My colleagues and I will be happy to respond to any questions that members of the committee may have at the appropriate time.

The CHAIRMAN. Thank you very much, Secretary Newman.

As was mentioned earlier, we are also honored by having the Honorable Mary Ellen Withrow, the Treasurer of the United States, who will be the next witness that we recognize.

STATEMENT OF HON. MARY ELLEN WITHROW, TREASURER OF THE UNITED STATES

Ms. WITHROW. Thank you, Mr. Chairman and members of the committee. It is an opportunity to testify before your committee here on the redesign of the currency, and it is going to be an exciting venture.

We are here because of the importance of protecting the integrity of the U.S. currency and because the changes to the currency which we are considering will further the continuing efforts to maintain that integrity.

The U.S. dollar has come to symbolize the strength and stability of our country and the integrity of our economy. It actually serves as the world currency and is vital in that role. To maintain this status, U.S. currency must be protected against the threat posed by modern technology. But if the changes that we are recommending are to be effective, they must also be universally recognized and understood by the public. Throughout the world, the new style notes must be as readily recognized and as accepted as the present design.

As you know, Mr. Chairman, some enhancements already have been successfully introduced and we have talked about those this morning: The security thread and the microprinting seen in the series 1990 notes. However, compared to these changes, the enhancements in the new currency will be dramatic—the first change in the basic appearance of U.S. currency in 65 years. This makes the issuance of a new design of U.S. currency especially momentous and the mission of public education critical.

The public must be reassured that previous versions of our currency are still valid and will not be recalled. U.S. currency has never been demonetized and it will not be demonetized in this case. This message needs to be underscored well in advance of the release of the first notes with the new design. In this way we can assure confidence and continuity in the handling of U.S. currency and avert public confusion as we change to the new design. To

maximize public acceptance and to minimize any confusion, the new currency will maintain many traditional American elements. The new currency will maintain its current size and colors, with portraits of the same historical figures on the faces and the same buildings or monuments on the backs.

Putting forth this information to the public will require a worldwide education campaign. The effort will be headed by the Treasury, with representation from the Bureau of Engraving and Printing, and the Secret Service as well as the Federal Reserve Board.

The scope of this effort will be even broader than the campaign to introduce the 1990 series. Effective methods of explaining the new features must be identified. Multimedia materials must be prepared, translated into the major languages of the world, and sent out for distribution worldwide. Bank tellers, cash handlers, enforcement and forensic agents must be trained to distinguish the new currency, and to feel confident in its recognition. By the time the new design is issued, the public must be well aware of what it will be seeing and know how to use the new features.

Moreover, this is not likely to be the last change in our currency design. In the future, more frequent changes will be required to meet the threat of advances in technology, and each change will necessitate further public education. Therefore, this campaign will set the stage and provide a model of operation for future efforts.

Mr. Chairman, we are confident in our decisions for the new currency design. We are equally confident in the public information campaign. Through the campaign, we will be able to introduce the new design to full advantage and to assure the world that our currency, whether the old design or the new, is secure and sound. I am pleased and honored to act as Treasury spokesperson for this campaign.

Thank you for this opportunity, and I will be happy to answer any questions you or other members of the committee may have.

The CHAIRMAN. Thank you very much.

Our next witness is Mr. Guy P. Caputo, Deputy Director of the U.S. Secret Service.

We want to thank you again. You have been before the committee on several occasions and have been most helpful.

STATEMENT OF GUY P. CAPUTO, DEPUTY DIRECTOR, U.S. SECRET SERVICE

Mr. CAPUTO. Thank you, Mr. Chairman, and good morning to you and to the other members of the committee. I appreciate the opportunity to appear before this committee and testify on the topic which I believe to be of the utmost importance. Today's announcement of the new currency design represents a significant step forward, and the Secret Service is pleased to have played an active role in the development of the program.

Commencing in 1865, the Secret Service has played an integral part in the investigation and suppression of counterfeit U.S. currency. While certain of the techniques used in that investigative mission have changed, the commitment on the part of this agency to maintain the integrity of our currency has remained constant. Just as our methodology has been periodically revised, so have the instrumentalities and techniques utilized by the criminal element

involved in the counterfeiting of U.S. currency. Access to a variety of technologically advanced equipment has resulted in a significant increase in the general quality of counterfeit currency.

As this committee is aware, the counterfeiting of our currency is not restricted by our territorial boundaries. To the contrary, we have seen a significant increase in counterfeit activity abroad. As an example, in fiscal year 1993, in excess of $120 million of counterfeit U.S. currency appeared abroad. In contrast, domestic seizures and counterfeit notes passed on the public accounted for $44 million. Using the first 6 months of fiscal year 1994 as a base, we are projecting that in excess of $130 million will appear abroad with domestic activity reaching $70 million. The increased extraterritorial activity is attributed to factors which include, but are not limited to, worldwide acceptance of U.S. currency; the processes by which U.S. currency may be replicated; technological advancements in the field of reprographics; the ability to easily transit most countries; and the inherent problems associated with multijurisdictional enforcement.

While overseas counterfeiting activity continues to receive significant media attention, we must not lose sight of the fact that there are significant domestic counterfeiting violations which also must be addressed in an aggressive manner. In fiscal year 1993, the Secret Service suppressed 127 counterfeit plant operations domestically, while arresting 1,899 individuals for counterfeit-related violations. During that same period, the conviction rate exceeded 95 percent. Based on the data from the first 6 months of this fiscal year, suppression of domestic counterfeit plant operations and arrests are projected to increase once again. These enforcement statistics attest to both the current level of criminal activity and the continuing need to maximize investigative efforts in that same arena.

The results of actual enforcement activities may be more easily measured than deterrence efforts. The Secret Service utilizes a variety of methods designed to minimize an individual's or group's potential for success in a counterfeit-related scenario. As examples, we have long maintained liaison activities with commercial vendors who provide printing supplies and/or equipment to the public. There is ongoing coordination among and between a variety of domestic, foreign, and international law enforcement entities, which is designed to ensure and therefore enhance lines of communication. The emphasis which is placed on liaison has proven to be an invaluable tool in the investigation of counterfeiting. Individuals and groups involved in counterfeiting activities, both domestically and abroad, continue to evidence multijurisdictional and/or international activity. In order to aggressively investigate those involved, it is necessary to effectively mobilize available resources. Consistent with that initiative, the Secret Service continues as a proven communication catalyst for authorities involved in the suppression of counterfeiting.

The Secret Service's mission, as it relates to the counterfeiting of the U.S. currency, is straightforward. As a Bureau of the Department of the Treasury, our deterrence program is directly linked to efforts on the part of the Treasury to ensure the integrity of our financial system. The Currency Redesign Program specifics pre-

sented here today provide significant overt and covert deterrence features for incorporation into our currency. The success of our investigations is directly correlated to our ability to identify counterfeit activity promptly. The overt features will allow for easy recognition by the public, which in turn will help facilitate that process. The covert features will augment machine readability and facilitate Federal Reserve currency processing.

I would like to emphasize that from an enforcement point of view, the integrity of the U.S. currency is dependent upon a two-pronged approach; namely, enforcement and deterrence. These efforts are not mutually exclusive; rather, they are codependent. While enforcement efforts are routinely reactive, security enhancements are deterrents, which when incorporated into currency design provide a proactive approach to counterfeit suppression.

The efforts on the part of the Treasury Department, and in particular the Advanced Counterfeit Deterrence Steering Committee and the New Currency Design Task Force, have been significant. The results of their involvement and commitment are in evidence today. There is now an increased awareness of future technological advancements which will necessitate a continuing program of currency redesign. Be assured, Mr. Chairman, that the Secret Service remains committed to the mission and takes pride in its continuing ability to make a significant impact on the problem as well as the solution.

Again, thank you for this opportunity to appear before the committee and to emphasize the strong support of the Secret Service for the new currency program. I would be happy to answer any questions you, or any of the other members, would have.

The CHAIRMAN. Thank you very much, sir.

Our next witness is the Honorable Edward W. Kelley, Jr., a member of the Board of Governors of the Federal Reserve System. We want to express our gratitude for your response and help to this committee, and we will recognize you at this point.

STATEMENT OF HON. EDWARD W. KELLEY, JR., MEMBER, BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM

Mr. KELLEY. Thank you very much, Mr. Chairman, and good morning to members of the committee. Thank you for the opportunity to present the Federal Reserve's views on the Treasury Department's plans to further protect U.S. currency from the threat of future counterfeiting. I have attached to my statement responses to the questions raised in your letter of invitation and I would request that they become part of the record. My remarks this morning will focus on the reasons the Federal Reserve fully supports the design improvements being considered by the Treasury.

Counterfeiting is, first and foremost, a serious crime, but one with a special dimension. For if counterfeiting were to take place in very large volumes, it might undermine public confidence in the genuine currency and might, in extreme circumstances, also threaten the Nation's economic stability. For these reasons, our government must be ever alert to opportunities to improve both its enforcement of anticounterfeiting laws and the design of the currency.

The United States has the benefit of a vigorous and highly effective enforcement of counterfeiting laws by the Secret Service. We

have also had a largely effective currency design, particularly with the addition in 1991 of two additional security features. Thanks to good law enforcement and a good design, as well as to a watchful public, the current level of counterfeiting activity is on the order of only $20 million per year passed on the public in the United States, or only about 10 cents per capita. Thus, counterfeiting has no discernible impact on the overall economy and places no constraint on the formulation or implementation of monetary policy.

Nevertheless, the security features of the current design probably are not adequate to deal with the counterfeiting threat of the future, which seems likely to be dominated by rapidly improving reprographic technologies, especially computer-based scanners, printers, and copiers, that will be available to large numbers of people and that will require little operator skill. We are also concerned about increasingly sophisticated counterfeiting by dedicated criminals; and by a greater proportion of this activity taking place outside the United States. Accordingly, the Federal Reserve strongly supports the Treasury Department's efforts to incorporate additional security features to currency now, in order to be better prepared for the threats of the future.

To provide some context for the committee's consideration of this design-improvement effort, I would like to comment on three related matters: First, the importance to the Treasury and to taxpayers, in financial terms, of the Federal Reserve's currency-issue function; second, the worldwide role of the U.S. currency and therefore the importance of maintaining worldwide confidence in it; and third, steps that the Federal Reserve might take to ensure prompt distribution of the newly designed notes.

Currency issuing is highly profitable for governments, because the issuance of non-interest-bearing central bank currency liabilities gives rise, correspondingly, to comparable holdings of earning assets by the central bank. The Federal Reserve System's balance sheet shows currency liabilities and corresponding earning assets, of about $357 billion. At a portfolio return of about 5.3 percent in 1993, the assets associated with currency outstanding generated some $18 billion in gross income for the Federal Reserve System and therefore accounted for most of the approximately $16 billion of 1993 net Federal Reserve earnings paid to the Treasury.

The needs of the domestic U.S. economy, however, do not account for all, or even most, of the $357 billion of Federal Reserve notes in circulation. This currency is widely accepted and used outside the United States, and in a few countries even plays a leading role as a substitute for the domestic currency. We do not have hard data on the amount of currency held abroad, and estimates are necessarily imprecise.

Research by the Board's staff indicates that probably over half, and perhaps in excess of 60 percent, of the $357 billion of U.S. currency may be in use outside the United States. Evidence also suggests that the percentage of U.S. currency held abroad has tended to increase in recent years. The worldwide demand for our currency contributes in a very important way to the direct financial benefits that taxpayers derive from the issuance of Federal Reserve notes—perhaps to the extent of 60 percent or $10 billion annually, of the approximately $16 billion earned through currency issuance. In ef-

fect, by holding our currency, citizens of the rest of the world are making an interest-free loan to the United States.

We cannot take for granted the choice of U.S. currency as both a store of value and a medium of exchange in countries whose economic or political situations make their own currencies less attractive for those purposes. There are other currencies and other instruments that would serve the purpose. The choice of U.S. currency is most of all a consequence of the esteem and confidence in which the U.S. Government, its political traditions, and its economic performance are held. Whether that esteem and confidence are maintained in the future depends primarily on the fiscal and monetary policies that are pursued here over the long term. The preference for U.S. currency abroad, however, and the associated financial benefits, also depend on confidence in the Federal Reserve notes themselves and could be diminished by widespread concern about the genuineness of U.S. currency.

Against this background, the Federal Reserve is preparing now for the challenges of active distribution of the newly designed notes when they become available and a prompt replacement of the Federal Reserve notes currently in circulation—on a worldwide basis.

As Secretary Newman and Treasurer Withrow have already stressed, let me not be misunderstood either. The Federal Reserve would not support and has no plans for a recall, demonetization, cancellation, or any other cessation of legal tender status of U.S. currency. All genuine U.S. currency now in circulation, whenever issued, is legal tender and should remain and continue to be legal tender.

For replacing Federal Reserve notes in circulation within the United States, it is likely that the Federal Reserve will follow the general approach we have used in issuing the series 1990 $100s, $50s, $20s, $10s, and $5s, which as you know have provided improved counterfeit deterrence in the form of security thread and microprinting.

In the case of $100s and $50s, which have an average life of more than 5 years, we knew that we would need to replace the outstanding Federal Reserve notes more promptly than on a business as usual basis. For those denominations, as soon as the Bureau of Printing and Engraving had shipped a sufficient inventory of series 1990 notes to each of the Federal Reserve Banks and branches, which was in August 1991 for the $100s and February 1992 for the $50s, the Federal Reserve began paying into circulation only the 1990 series notes.

As a result of that procedure, series-1990 notes now comprise over 80 percent of general domestic circulation of those denominations. Series 1990 notes of the $20 and $10 denominations were first paid into circulation by the Reserve banks in the fall of 1992. Since those denominations have an average life of only 2.5 to 3 years, the Federal Reserve has retired the pre-1990 notes only when they are judged to be too worn or soiled for further circulation. As a result of this procedure, we have achieved a replacement rate comparable to that of the $100s and $50s. Series 1990 notes now comprise about 60 percent of those denominations in general domestic circulation.

For replacing Federal Reserve notes used outside the United States, a more active approach may be required for the newly designed series. In contrast to the 80 percent replacement rate domestically, we estimate, for example, that only about 50 percent of the $100s circulating abroad and only 65 percent of the $50s abroad are series 1990 notes. The present replacement procedures may not be considered sufficient for the newly designed notes. The Federal Reserve is therefore considering the benefits and costs of a number of available options for expediting the replacement of notes that are outside the United States when the newly designed notes become available. No decisions have been made except, again, that there will be no recall or demonetization of existing currency.

In conclusion, I would like to thank the committee for this opportunity, and again, I would like to reiterate that the Federal Reserve fully supports the design improvements being considered by the Treasury. It would further the interests of the United States to enhance its currency by making it as secure from counterfeiting in the future as it has been in the past.

Thank you very much.

[The prepared statement of Mr. Kelley can be found in the appendix.]

The CHAIRMAN. Thank you, sir.

Our next and final witness on this panel is Mr. Peter H. Daly, the Director of the Bureau of Engraving and Printing. And if Mr. Ferguson has any remarks, we will recognize him after you.

STATEMENT OF PETER H. DALY, DIRECTOR, BUREAU OF ENGRAVING AND PRINTING

Mr. DALY. Thank you, sir.

Good morning, Mr. Chairman and members of the committee. Thank you for the opportunity to appear before you today to discuss the technical aspects of U.S. currency redesign. With me is the Bureau's Assistant Director for Research and Development, Mr. Thomas A. Ferguson.

Research into advanced counterfeit deterrent features for U.S. currency has been under way at the Bureau since 1982. As you know, Mr. Chairman, two new such features, a denominated security thread, and microprinting around the portrait, were added in the 1990 series currency primarily to defend against the high fidelity color copiers entering the world market. These features cannot be reproduced on those machines and appear quite effective in deterring conventional counterfeiting as well.

Most counterfeiting continues to be of series notes before 1990. Immediately after implementing the 1990 series, BEP began active research into next-generation counterfeit deterrence. We contracted with the National Academy of Sciences for an updating of its original 1987 report on anticounterfeiting technologies suitable for use on U.S. currency and conducted a comprehensive industry survey for emerging or innovative ideas for enhancing the security of our currency from counterfeiting. These efforts resulted in an inventory of 14 features which could be used immediately, and a number of others which have potential, but require further development.

With the strong interest and support of Secretary Bentsen and Under Secretary Newman, we began development of a new design

for U.S. currency which could accommodate the production-ready features while providing sufficient elasticity of design so as to accommodate new features which might be required later to defend against even newer technologies.

As you know, Mr. Chairman, the design of U.S. currency has been stable for about 65 years, with only minor changes. However, the combination of rapidly advancing technology and continued strong world demand for the dollar makes most unlikely a similarly long period of constant design. Rather, I think we have entered an era of regular change, so that we may always stay ahead of the curve and be as preemptive as possible in deterring new counterfeiting threats.

In creating this new design concept, we have endeavored to retain the traditional look of the dollar. Although the visual changes to this new series U.S. currency will be more dramatic than seen in many years, we believe it essential to keep as much as possible of the traditional design so as to minimize the natural confusion which will develop during the initial phases of the changeover. Accordingly, we have only made changes that allow for the inclusion of specific counterfeit deterrent features. Therefore, the size, portrait subjects, national symbols, and colors used on the new series will be the same as those used on the current one. Also, the same classical bank-note style engraving technique will be used on the portraits, borders, and numbers. What will change, however, is the configuration of these elements on the note so as to allow for the inclusion of new deterrent features or to strengthen the ones already in use.

At this point, the final costs of the enhancements cannot be defined, as contracts have not been made and prices are dependent on the final package of features and volumes. However, we estimate that these enhancements will add approximately 20 to 25 percent to the cost of currency or approximately 1 cent per note. This would represent an increase of between $7.5 million and $10 million for new $100 bills in the first year of their production.

The BEP operates on a revolving fund and the cost of currency, including these enhancements, is paid for directly by earnings of the Federal Reserve System. Therefore, no appropriations will be required to support this effort. Also, as Under Secretary Newman and Governor Kelley note, the value to the Treasury of wide acceptance of our currency exceeds these costs by many multiples.

The BEP and the Federal Reserve System are prepared for the introduction of this new currency. Adequate production capacity exists to meet both the current demands and the conversion to the new series.

Mr. Ferguson will now detail the design elements and explain the technical reasons for their value as deterrents against various methods of counterfeiting.

Thank you very much, Mr. Chairman.

The CHAIRMAN. Thank you.

[The prepared statement of Mr. Daly can be found in the appendix.]

The CHAIRMAN. Mr. Ferguson.

STATEMENT OF THOMAS A. FERGUSON, ASSISTANT DIRECTOR FOR RESEARCH AND DEVELOPMENT, BUREAU OF ENGRAVING

Mr. FERGUSON. Thank you. If you will allow me, I will stand up for this.

The CHAIRMAN. Yes, sir.

Mr. FERGUSON. As has been mentioned several times this morning, we are going to be introducing a series of new features to the currency. The depiction up here shows some of the basic architectural changes that we will be making to the design of the note to allow that to occur.

I point out that this just depicts areas for the new features. We will still be maintaining a number of the traditional features—the seals, the serial numbers that are not depicted here.

I would also like to say that we will be maintaining the traditional fineline engraving and intaglio printing, the distinctive feel of our currency paper; we will be maintaining those features which the public is used to and has been using for, obviously, a number of years now to authenticate their currency. We will be enhancing those features, however, by the addition of a number of features. There are examples of several of these, as I discuss them, they can be passed around. They are labeled so that you can tell which ones they are.

The most distinctive feature on the new note will be the larger portrait. It will be shifted slightly off center of the note, which is a little different than we are used to. That will provide an opportunity for us to have room on the note to incorporate several of the other features, the watermark and moving the threads to specific locations. The portrait will be larger. Again, a traditional hand-engraved, high-quality print of the same person who is on the notes now. For example, obviously, on the $100 it would be Ben Franklin.

The reason for its being larger is it is the most recognizable feature that we have on the note. You want the most detail. We could put more engraving, more lines, more detail, harder for other people to reproduce, easier for the general public to recognize.

The next most obvious feature will be the addition of a watermark. Watermarks are used on a number of currencies of countries around the world. A traditional feature in security printing, but one that has a place in a comprehensive design. They are very effective against copying, very hard to duplicate or simulate.

That will be located on the far right-hand edge as you look at it. It will be a portrait watermark on the high denomination notes of the same figure that is in the engraving. Easy for people to recognize that it is the same person, they don't have to worry about people changing paper, using a lower denomination paper to print a higher denomination note.

The security thread that we use currently will be maintained and enhanced. It will be enhanced in two ways. The first way will be that it will be in specific positions on the note for each denomination. By moving the portrait to the side, we will create channels for each denomination of thread, which makes it harder again for someone to use a low-denomination paper, bleach it out and print a high-denomination note. Plus, by making the thread machine detectable, it will make it easier for people using machines to denominate the currency.

We will be adding something called iridescent microprinted planchets and as we pass around, you will see. Planchets are small colored disks that are added to the paper during the manufacturing of the paper—again, traditionally used in security papers, travelers checks, stock certificates, usually just colored disks. These are iridescent in that they shine and have a slight change of hue as you look at them from various angles—impossible for a copier to copy that feature of the planchets.

They will be microprinted in that they will have the denomination of the note on the planchet in very, very small type. This is a secondary backup feature making it extremely difficult for someone to just add colored disks to the counterfeit to simulate the planchets.

We will continue to have microprinting. Currently, the microprinting is around the portrait. We will add microprinting in other areas of this design. Microprinting is extremely small text below the resolution size of most copying equipment today, very difficult for other people to reproduce through that manner, easily checked by the public with a magnifying glass.

We will have color-shifting ink, and again, there is an example of that going around. It is a printed, optically variable system. It is an ink which contains a color pigment which changes color when viewed from different angles. If you take the document and hold it in a normal viewing angle, it appears one color, and as you shift it, it turns to another color. Again, a feature which is very, very, very difficult to copy and reproduce. Copiers can copy one color, but cannot reproduce the color-shifting capability of the ink.

The final feature listed on here is moire-generating line structure, which is the inclusion of the line structure that, when scanned, if you will, similar to if someone is wearing a striped shirt on a color television set and you see the distortion caused by the scanning of those lines. The one that is being passed around for the committee to view is actually a pattern that was derived by a member of the National Academy of Sciences. It is based on fractal geometry, it is a space-filling, self-similar pattern based on a mathematical formula. Those features will all be included in the package that we will be testing for final evaluation for production.

What is important to note is that they act together, that adding one feature doesn't—by itself, is not the issue here, it is adding a package of features. However, as we go forward and take the features that we have done in thousands and go into producing billions, there is the potential that one or more of these features may not make it to the final product. And we will be enhancing several of these as we go through. Important will be to come up with a reducible, effective, reliable piece of currency at the end.

Thank you for your attention, and I will be happy to answer any questions.

The CHAIRMAN. Thank you very much, Mr. Ferguson.

Let me advise that the written statements that each one of you gave us will be in the record exactly as you give them to us. Also Governor Kelley's ad seriatim response to our letter inviting him and stating the points of interest we wanted him to testify to will be completely in the record following your oral presentation.

Second, I want to advise my colleagues that we have a second panel following this one, and we don't want to hold them here throughout the whole lunch period, so we want to expedite our questions. And I will hold to the 5-minute rule very rigorously.

And also I ask unanimous consent that all members present and absent will have the privilege of submitting either preliminary opening remarks for the record or questions to the witnesses in writing.

I had one or two questions that I think will keep me within the timespan. First, to Governor Kelley, in your opinion, how do you believe that the banking system will react to the change in the design of the currency?

Mr. KELLEY. Mr. Chairman, I would not foresee any negative reaction for any reason, and I would foresee that it would be welcomed in the sense that the banking industry is very interested in having a safe, secure currency with as much integrity as it possibly can have. And so I would expect it to be very welcome.

The CHAIRMAN. Very good. Do you believe that the new currency will affect the holdings of the dollar by the central banks of foreign countries?

Mr. KELLEY. I think that central banks, which is your question, largely hold dollars in other forms and for other reasons. We are discussing currency here this morning; it is held in very large amounts overseas, but I think when we speak of central banks and their holdings of foreign currencies, we are not generally talking about currency per se, and we are not generally talking about those considerations that would surround a discussion of currency.

The CHAIRMAN. OK, sir.

Mr. Caputo, according to the U.S. Secret Service annual statistical summary for the fiscal year 1993, the agency resources focusing on the counterfeiting of U.S. currency abroad resulted in the reporting of foreign-originated notes valued at approximately $120 million. What is perplexing is that for the 6 years prior to 1993, the average amount of foreign-originated notes reported was valued at about $35.7 million.

What is the explanation for this dramatic rise in the number of reported U.S. notes originating overseas?

Mr. CAPUTO. One of the factors, Mr. Chairman, is a direct result of an extensive, aggressive liaison campaign that the Secret Service has employed overseas to heighten the awareness of foreign governments and foreign law enforcement officials to deal with counterfeit currency. Since the beginning of 1993, we have held training seminars, courses, and lectures on counterfeit note detection for close to 500 foreign law enforcement officials and foreign bank officials. That represents seminars being conducted in 40 to 50 different countries.

We would also suggest that because of the acceptability and the desirability of U.S. currency overseas, there is a greater probability that it will remain the currency of choice for counterfeiters. Last, it is believed that U.S. currency is one of the easiest to counterfeit. In summary, I believe that the dramatic increase in the overseas reporting is the result of aggressive liaison, wide acceptance of the currency, and the ease with which it can be replicated. The fact

that technology in this area continues to improve, will only serve to enhance those counterfeiting opportunities.

The CHAIRMAN. What about the domestic picture? You answered one or two other questions I had thought of, but what about the domestic? Has there been a corresponding dramatic high rise, or not, as reflected in this foreign originating counterfeiting?

Mr. CAPUTO. It certainly hasn't been as dramatic—either an increase or decrease—domestically, Mr. Chairman. Counterfeiting per se is a crime of opportunity, it is a crime where people who have the necessary tools and the desire and the ability to perform that particular crime make use of whatever technology is available, and as the technology improves, the potential for that crime to increase also rises. In our particular case, a lot of times, counterfeiting is a crime where there are peaks and valleys, and you really can't look at a straightline trend. And depending upon the amount of paper or supplies or printing equipment that particular individuals might avail themselves to, that would have an impact on the amount of currency or the potential amount of currency that someone might counterfeit.

The CHAIRMAN. Thank you very much. I have several other questions. I will submit them in writing. My time is up.

[The questions referred to can be found in the appendix.]

Mr. Leach.

Mr. LEACH. Thank you, Mr. Chairman. Mr. Newman, we welcome you particularly as the first senior Treasury official to appear before the Banking Committee in 1994. I was particularly impressed with your emphasis on looking forward as a reason for the redesign. But I am not as convinced by your statement that this is not a response to a crisis, not a response to any current counterfeiting case.

The information we have is that there is significant counterfeiting going on in the Middle East today. Is that valid or invalid?

Mr. NEWMAN. Well, I will ask Mr. Caputo to comment a little bit more on the specifics, but I think it is fair to say, Mr. Leach, that the individual cases that have been uncovered are symbolic of the use of advancing technology. There is no individual case that is presenting a critical situation for us.

Mr. LEACH. There is not?

Mr. NEWMAN. There is not.

Mr. LEACH. Mr. Caputo, would you agree with that?

Mr. CAPUTO. Yes, sir.

Mr. NEWMAN. However, the trend is really the issue. If a bill can be made and it takes a while for us to detect what the flaws are, the Secret Service finds the flaws——

Mr. LEACH. But have I been misled?

It is my understanding that there is a capacity in a particular Middle Eastern country to make $100 bills, so-called super bills, which is rather extraordinary, and that, quite a few bills could be made in a rather short period of time.

Is that false, Mr. Caputo?

Mr. CAPUTO. Rather than get into the specifics in this particular forum, Mr. Leach, and at your suggestion or request, we would be happy to provide a private comprehensive briefing, for you or any of the other members on any particular ongoing investigation.

It is fair to say, though, that the increase—there has been a dramatic increase based on the observations of the chairman in terms of counterfeiting overseas. There are varying degrees of quality of counterfeit currency, both domestically and abroad, which present a number of problems in terms of detection. However, there is no counterfeit U.S. currency which cannot be detected. The increase in foreign seizures indirectly corroborates that.

Mr. LEACH. But not on this particular issue of a super $100 bill in the Middle East, have you?

Mr. CAPUTO. Again, without trying to get into some sensitive information, I can assure you that this bill that you may be referring to is just one of a number of counterfeit bills that are appearing overseas.

Mr. LEACH. Well, let me just go on for a second here.

I agree with everything presented here. On the other hand, I must tell you I am a little surprised that what has occurred is an announcement of a framework for a new bill with possible ingredients, not a new design, which I would expect. We have been working on this for quite a number of years. With today's announcement the new bill will not come into being until 1996, which is 1½ years away at the earliest, and could be up to 2½ years away. And so what is being announced here is a framework approach, not a new design.

That partly gets to the issue of whether this is a crisis, is there a specific counterfeiting circumstance of particular concern, and do we need to act more promptly? Not that one wants to suggest a crisis, because that is too large, but it certainly had been my impression that with regard to the super $100 bill, there was a very serious problem that was growing. Once one has the capacity to manufacture one of these, there is an assumption that quite possibly a larger run could be done with relative ease. The statistic that you have just presented of $135 million or whatever figure being predicted could prove to be quite valid, it could prove to be an educated guess, or it could prove to be way off the mark.

Let us pretend for a second that it is off the mark. Is there a capacity to move more rapidly? Could this new bill be done next month or what is the earliest timeframe that something of this nature could occur?

Mr. NEWMAN. Let me try to comment on that, Mr. Leach.

There, clearly, are two different problems we are attacking simultaneously. We are trying to move ahead as rapidly as we can on the new technology, do it right and do it with a proper design. And the Bureau of Engraving and Printing is proceeding ahead. If we are able to do it any faster, we will.

Secretary Bentsen shares exactly the same view that you and Chairman Gonzalez have commented on. He wants to get this done as rapidly as possible. It is really a technical matter of what it takes to get it properly designed.

Mr. LEACH. My time has expired. Other people would like to talk. I would only end, if I could, in 10 seconds.

Part of the bill that the chairman and I have introduced also calls for more sanctions against those that counterfeit abroad. We have tough domestic sanctions, surprisingly few international ones and sanctions against countries that authorize such counterfeiting.

Answering yes or no, I take it, Mr. Caputo, you would have no objection to that kind of an approach?

Mr. CAPUTO. We would welcome that approach, Congressman.

Mr. LEACH. I appreciate that. And you consider it something that we ought to do?

Mr. CAPUTO. Yes. Anything that would help us, obviously, is something that we would welcome.

Mr. LEACH. I appreciate that.

Mr. CAPUTO. Thank you, sir.

Mr. LEACH. Thank you.

The CHAIRMAN. Mr. Kennedy.

Mr. KENNEDY. Thank you, Mr. Chairman. You know, I was looking at that silhouette and, Henry, I think if you let your hair grow a little bit longer, there is some potential that you might make the $100 bill over there. What do you think?

The CHAIRMAN. Well, that is Ben Franklin, and I think he was wearing a wig. I don't think he had any more hair than I do, because I have seen some other pictures of him, especially when he was in France.

Mr. KENNEDY. Did you know him back then or what?

The CHAIRMAN. Oh, for those days that it was acceptable to wear a wig.

Mr. KENNEDY. In any event, I too am struck by some of the numbers that Mr. Caputo—actually, the tremendous success of the Secret Service in the United States at being probably one of the most incredible law enforcement agencies in the country with regard to stopping the use of counterfeiting here in America. I mean, I am astounded that there is only some 11 or 19 million dollars' worth of counterfeit money in America.

It seems while that, obviously, is a large amount of money in some ways, given the amount of funds that are stolen on an annual basis in America, given some of the figures that we see white collar criminals that have testified in this committee room steal out of individual banks, it is a drop in the bucket compared to the kind of crime that takes place in general. So I guess I am, first and foremost, just astounded at the effectiveness of the current enforcement procedures that your agency and, I suppose, other law enforcement agencies are involved with.

It does raise the question as to whether or not we are sort of—I look around this room and I see all of these individuals and all of the lobbyists and everybody else and the TV cameras and I am kind of wondering what our priorities are here. The fact is that it seems to me that these—as I understand, even with the strips that we authorized a couple of years ago, that we have already seen those particular strips already being forgeries, or we have seen them made into false dollars already, that these changes, while I suppose are going to be effective for some time, my instinct tells me that there is going to be some fellow that comes along very, very quickly who figures out how to forge this one. And you are going to be back in here very quickly saying, we have got to change this one around. And maybe then we will get either the chairman or Hillary or somebody else on the front of the $100 bill.

So I am wondering whether or not there isn't some way of, rather than redesigning this whole bill every—what will end up being on

a very regular basis, if there isn't some other more—perhaps simpler method of changing the, you know, either the serial numbers or some other kind of mechanism, if the bills, as I understand it, only last 18 months in the normal flow of currency anyway, is there not some other, easier way than redesigning the $100 bill which will—I mean, Frank, tell me, aren't you going to have to do this all the time if you are going to keep up with the forgers that are out there?

Mr. NEWMAN. I think that is right, Mr. Kennedy, and we share your objective; and the committee looked at that pretty hard and concluded that there was no other practical way to do it. Almost every other major country around the world is going through the same thing, and in one stage or another has redesigned their currency and will be redesigning it.

The fact that we have this combination of features here is going to make it much more difficult for somebody to duplicate than otherwise. But it is very, very likely, as you say, that as technology develops, that we will be doing future generations, as I think every other country will, as technology advances.

Mr. KENNEDY. What do the experts tell you about how long this one will last?

Mr. NEWMAN. Well, Mr. Caputo, how long would you say they would last?

Mr. CAPUTO. I would say it would last until somebody comes up with something that can be—to compromise it. I don't know that there——

Mr. KENNEDY. A year, 5 years?

Mr. NEWMAN. The problem is, we are predicting future technology. This is very, very effective against all known technology, and it is virtually impossible to predict what new technology somebody might come up with. That is another reason why the two-pronged approach is important.

In addition to this multiple set of features that we are going to be introducing, it is going to be important for the Secret Service to continue its diligent enforcement activities; that is, to protect against the counterfeiting of the old bills, as well as anybody who might find a way to compromise some of the new features.

Mr. KENNEDY. And just—for another 10 seconds, it just seems to me in a very simplified manner that if you had, for instance, a series at the beginning of each bill, if they only lasted 18 months, that you could probably limit the number of—the amount of forgeries simply by having those be outdated every 18 months. So the only time that somebody could have a legitimate forgery that would actually work out there for the $100 bills would be on an 18-month basis. So I would think that you could design a system that, while it wouldn't be completely foolproof, would limit the amount of forgeries that could possibly be put out onto the market in a short period of time without having to go through a major redesign and a whole, you know, conniption as we are going through and as we will continue to go through to come up with a design of $100 bill and then a $20 bill and then a $1 bill and everything else that is obviously going to take place, you know, in order to get this thing accomplished.

So it just seems like it is an awful lot of effort to go through for what is currently an $11 or $19 million problem on a simplified basis.

That is the end of my questions. Thanks, Mr. Chairman.

The CHAIRMAN. Mr. Kennedy, with respect to this hair business——

Mr. KENNEDY. Uh-oh. I think I am in trouble.

The CHAIRMAN. I think I will be around, but when you are 78 years of age, I want to see how many of those curls you still have. They have a saying in Spanish, it is really a Mexican saying, "no hay burro pelon," meaning that there is no such thing as a bald-headed burro.

Mr. KENNEDY. I don't think I am the guy that has to worry about that one at the moment, Mr. Chairman.

The CHAIRMAN. Mr. Lazio.

Mr. LAZIO. Thank you, Mr. Chairman.

Good morning, Secretary Newman, I just want to echo what my friend from Iowa, Jim Leach, had mentioned before about the need to move ahead; and I am very happy that you are here today.

We had a report from the National Research Council that INTERPOL rarely encounters currencies from nations that have incorporated sophisticated security features, and that 87 percent of the bills that come to their attention are American counterfeited notes. So I think that probably speaks to the need to move ahead aggressively on this.

But I really want to get into some of the reports of counterfeiting in the Middle East that Jim Leach was beginning to touch on. I have seen reports that as much as $12 billion of counterfeited notes that have originated in the Middle East, mainly in Iran, Syria, and the Bekaa Valley are in circulation.

Is that a number that is accurate, Mr. Caputo?

Mr. CAPUTO. We couldn't begin to talk about the amount of money, whether it is domestic or abroad, that happens to be in circulation that is counterfeit. We capture our statistics based upon notes that are seized, notes that are passed on the public, notes from countries where actual local police entities make significant seizures. In our estimation, about 95 percent of the seizures of counterfeit U.S. currency attributable to overseas are made by foreign law enforcement, with which we maintain active liaison.

There is a lot of speculation about the varying degrees of quality of bills, the locations where bills are originating and circulating. Counterfeiting has really no boundaries, whether it is domestically or overseas.

We can, again in a private session, get into more detail about some of the sensitivities and the intricacies of these ongoing investigations. But I think it is safe to say that there are a number of bills of varying denominations that are of such quality that people overseas are counterfeiting them and local police entities with foreign governments are seizing them on a very frequent basis, to the tune of $120 million last year. So the enforcement effort overseas is there in conjunction with the Secret Service.

That continues to remain very constant and very aggressive. The quality of bills we see, both domestically and internationally, leads us to believe that this is the course of action that we need to em-

ploy, not only at this particular moment, but for future technological changes and designs. The efforts will make it less attractive for someone to counterfeit U.S. currency.

Mr. LAZIO. Let me ask you, are you talking in terms of an individual or a group involved in counterfeiting? What about where a nation is involved in either aiding and abetting or actually counterfeiting funds. To what extent—let's say hypothetically or historically, whatever your choice is, does that complicate your ability to avoid the need to reproduce currency or to have these reproduced, these new notes reproduced?

Mr. CAPUTO. If I understand your question, if hypothetically there was a government-sponsored counterfeiting effort, then certainly that would be of concern not just to the Secret Service. But, again, without getting into specifics in this forum, we don't have any conclusive evidence at this point.

What I would suggest, with your indulgence, is that in a private setting—because there are a number of counterfeit bills that we are aggressively investigating with foreign entities; we have task forces with our own personnel participating with enforcement entities from overseas. There is a concerted effort on all of the counterfeiting that is occurring internationally—and if it would be of some value, we would be happy to give you some specific information in a private setting.

Mr. LAZIO. I think that would be considerate of a number of members.

If I could just have one last question, if I may, and that goes to the fact that it appears that most of the notes that are uncovered are of higher denominations. Is there a need to have more sophisticated—what do they call that—sort of antidetection watermarks or whatever in the higher denominations than in the smaller denominations?

Mr. DALY. Yes, sir. The strategy is to have the most sophisticated in the larger value notes.

Mr. LAZIO. So it will be tiered?

Mr. DALY. Yes.

Mr. LAZIO. Thank you.

Thank you, Mr. Chairman.

The CHAIRMAN. Mr. Watt.

Mr. WATT. Thank you, Mr. Chairman. I just have two very quick questions. I suppose I should address them to Mr. Newman.

It sounds to me like the magnitude of the problem will make this first question somewhat academic, because I assume whatever amount it costs to do this transition process to the new currency, it would be cost-effective. But just as a matter of curiosity, we projected the cost of going through this process, and what is that, if you are able to tell us?

Mr. NEWMAN. At this point in time, Mr. Watt, we have pretty good estimates for what it will take, at least to do the $100 bill. The other figures have yet to be produced. But in the first year we would expect $7 million to $10 million of additional expense associated with the production of the $100 bills. Cost-effectiveness, clearly, is a consideration, and as we were looking at various alternatives, we did consider the cost of producing them.

In a sense, this is like an insurance policy. It is a question of how much does it make sense to spend to protect against a future threat of some sort, and there is, obviously, a judgment call involved. But after our own consideration, and getting the advice of the National Academy of Sciences, we do feel that these are cost-effective.

Mr. WATT. I take it the lower denomination, higher exchange denominations would be even more expensive than $7 million to $10 million?

Mr. NEWMAN. They would, clearly, be more expensive because of the total amount of bills produced, although as Mr. Daly just mentioned, we won't be necessarily putting every security feature in the $5 bills, for example, so there is a little bit of a tradeoff.

Another way of looking at it is that we are talking about going from an average cost per bill of about 3.8 cents to maybe 4.5 cents or 4.8 cents, something in that range.

Mr. WATT. The second question I had has to do with the replacement or recall or getting these new bills into the process. I am not sure I understand how beneficial this is unless there is a systematic approach to replacing existing currency that is out there. And while Mr. Kelley started to touch on this and indicated that, over time, you got to a 70 to 80 percent replacement, if that leaves 20 to 30 percent of the existing currency still out there circulating, with people still having the ability to counterfeit that currency or that part of the currency, how is this effective? And have you thought of any more systematic approaches to—not recalling dollars that are out there, but certainly more aggressively than Mr. Kelley seemed to suggest—replacing the dollars that are already in the stream of traffic here?

Mr. KELLEY. Well, Mr. Watt, if I may comment briefly on that. The problem starts with the agreement on the part of the Treasury and the Federal Reserve and everyone else that I have spoken to, that it is highly undesirable, and has never happened in the history of the United States—that we would cancel or demonetize in any way any legal tender that has been issued by the U.S. Government. If we continue to have that policy, then the only way to replace currency is as it comes back through the banking system and recycles through the Federal Reserve; and as I indicated in my testimony, we have had a couple of strategies for accomplishing that as quickly and as cost-effectively as possible. But the fact is that there is some residual amount that probably never appears, or at least appears very, very slowly. We will get it when it comes through, but that is the only way that I know of to do it, other than to demonetize or cancel, which no one feels is desirable in any way.

Mr. NEWMAN. It does mean that as the percentages outstanding decline, it will be more obvious if one of the old bills comes through and they will be given more scrutiny. And because the new notes will be visibly more different, they may move through a little bit more rapidly.

Actually, we have some experience in this with other countries too. I was in France just recently and visited with the Governor of the Bank of France, and they are undergoing a similar program. They are redoing their currency, actually quite dramatically, with security features. But I happened to have at home a couple of old

50-franc notes that I had from a prior trip to France a couple of years ago and they now have new 50-franc notes with a very visible difference, very visible security features in circulation there.

But when I arrived there, there was no problem at all, going through the same process; the old notes are still valid, but all they are printing now is new notes.

But it does mean that the Secret Service has to put a lot of effort into monitoring and staying ahead of counterfeiting efforts on the old-style notes. And that is a very important, ongoing part of the total program, but the combination over time should be effective.

Mr. WATT. Thank you, Mr. Chairman.

The CHAIRMAN. Mr. McCollum.

Mr. MCCOLLUM. Thank you very much, Mr. Chairman.

Mr. Caputo, I understand from listening to the questions and answers from Mr. Lazio a moment ago that there are some things that are sensitive that you can't really talk about in open session today. He asked you, as I recall, about the possibility that there was as much as $12 billion that could be produced in circulation of counterfeit $100 bills out of the Middle East; and if I am not mistaken, you indicated that you would like to have that as a private discussion if we talk about that. Am I correct in that?

Mr. CAPUTO. That is correct, Congressman.

Mr. MCCOLLUM. Also, I don't know whether this gets in there, but I would like to ask it in as general terms as I can: Can you tell us whether or not counterfeit $100 bills produced abroad are being used by organized crime in Europe and the Middle East as a part of their business? Can you tell us that?

Mr. CAPUTO. What we can say anecdotally is that, both domestically and overseas, criminals will get involved in any illegal activity that will produce some revenue for them; and we have found that in some cases—again, anecdotally—that there may be counterfeit currency that travels in the same kind of distribution channels that drugs may travel, or stolen cars may travel. People make use of the same kinds of distribution channels and methods of distribution.

We have not found, though, that there is an inordinate correlation between one particular type of criminal activity and counterfeiting.

Mr. MCCOLLUM. Mr. Caputo, I realize the constraints that you have on you; and I know you know some of the things we have done with the terrorism task force that have produced some big bills back in 1992. As you may recall, the terrorism task force actually got involved with getting some folks who went inside a ring that operated out of Iran and, with the aid of Syria, produced quite a number of $100 bills that we literally produced for the Secret Service, that were physically handed over to you.

The group involved, that were inside that operation, expressed to us—and we expressed it publicly at that time with some chagrin for the Department of the Treasury, but we felt it was important—that those fake $100 bills were capable—the State of Iran was capable of producing up to $1 billion of those in a given month, or $12 billion a year, which is where that figure comes from. Since then, our investigation has shown that we are seeing a network of those $100 bills being used by the Mafia and organized crime, by Iran and other countries in the Middle East, in efforts to acquire

nuclear weapons materials from the former Soviet Union and a number of other sources.

I know you cannot comment on this, but I also understand how important this is, and while there might not be a crisis to our economic stability, that Mr. Newman said we don't have, there certainly is a crisis in this aspect of it, in my judgment.

My understanding also is that we are now beginning to see some of these same folks produce the deutsche mark and some other foreign currencies in fake or phoney bills of some sizable denominations for similar circulation purposes.

With that in mind, Mr. Chairman, I would suggest, hearing what Mr. Caputo had to say today and not able to talk about that, we might have an executive session at some point with him. I don't know, you and I haven't talked about it, but if the Secret Service could share some of this with us in an executive session that we can't share publicly, that is certainly understandable.

What I am saying is public information, because it is what our terrorism task force has published over the past couple of years—with which I am sure Mr. Caputo is familiar, as you are shaking your head—that we have provided you that data.

Mr. CAPUTO. That is correct; certain of the data.

Mr. MCCOLLUM. But he cannot comment on it in more detail. I would certainly encourage us to look into it. I think the Treasury Department, both of this administration and of the previous one, have been very, very sensitive to what we have done publicly.

I am pleased the design efforts or redesign efforts are going on, Mr. Newman. I think this is very, very, very important, but I think that you, as your predecessors, are downplaying the grave problem. The problem is worldwide (not necessarily in this country) and involves the $100 bill, the dollar itself, organized crime, and with State-sponsored production of these bills. I think it is exceedingly important that we get to the bottom of this.

Mr. Chairman, I would encourage that, if we could have an executive session, and I thank you.

The CHAIRMAN. Thank you very much.

Mr. Klink.

Mr. KLINK. Mr. Chairman, I just wanted to follow up a little bit on Mr. Watt's line of questioning, because I am not sure that we, in the limited amount of time that we had, really had a chance to get to the bottom of it.

Has any real consideration been given thus far to a recall of currency? Has that whole process been thought through?

Mr. KELLEY. I am unaware of any serious consideration that has been given to that as a viable and desirable idea for the policy of the United States.

Mr. KLINK. The point again being, as Mr. Leach said, that we are going to be 2½ years out until this occurs at any rate; and it appears to me that there is going to be a catch-as-catch-can method for drawing the money that is out there in circulation right now. I understand the logistical difficulty with this, and again, just playing devil's advocate—not that I am—I am intrigued by this idea, but I am not necessarily suggesting it—there have been people that have suggested that if we were to do that, not only would we be able to take care of the counterfeiting, but those that have been

able to compile huge amounts of undocumented wealth through drug dealing or any other illegal activities would have to turn that money in and therefore would have to account for it in their tax liability as well. That has not been given any consideration?

Mr. KELLEY. There have been proposals to do that. I think that the Federal Reserve would oppose those. I think the first thing one has to keep in mind is that the perfectly legitimate uses of currency far, far, far exceed the illegitimate uses; and as we attempt to suppress the illegitimate uses, we have to be very careful that we don't let the tail wag the dog here and essentially disenfranchise or in any other avoidable way discommode the many, many, many perfectly legitimate uses of our currency along the way. And I think that that is a position from which we have to start.

Mr. KLINK. How much currency—how much U.S. currency—is there any estimation—is currently out there?

Mr. KELLEY. Altogether, we have issued on the order of approximately $350 billion. It is estimated broadly that something over $200 billion of that, perhaps $210, $215 billion of that is held overseas. But as I indicated in my testimony, that is only an estimate, and hard numbers are not available.

Mr. KLINK. Mr. Caputo said that they had no estimation as far as—if I understood you, Mr. Caputo, you have no definite estimation as far as how much counterfeit may or may not be out there; you only know from what you are able to confiscate.

Do you have any estimation in addition to the $350 billion that you estimate that the United States has issued, how much additional monies may be out there floating around in counterfeit currencies?

Mr. KELLEY. I have no knowledge of that, sir. All I know is what we encounter at the Federal Reserve and the information that we get from the Secret Service as to others that they interdict in various ways. I think Mr. Caputo has got better statistics than I do—on the aggregate—than I do on that.

Mr. KLINK. Thank you very much.

Mr. Chairman, I yield back my time.

The CHAIRMAN. I have 2 minutes and I think we ought to round out this hearing in view of the fact that some questions have been directed that the staff had anticipated. Also, I want to recognize at this time the staff's excellent work, particularly Mr. Tristan North, who actually spoke at our preparation.

There is a lot of work that goes into these hearings, just like over on your side, and we were informed that there would be a likelihood of these questions on the so-called super notes. So I think the record ought to show that we were notified by the officials of the Department of the Treasury that certain members would be raising these issues, mostly based on a task force, which is really a House Republican task force, and some of the findings or statements made as a result of that task force were speculative. They weren't, as far as I can tell, ever corroborated.

The Secret Service advised us that in anticipation of those questions that if they were to go into the speculative side of that, the Department would be loathe to discuss the implications of that inasmuch as it would compromise their ongoing efforts made in conjunction with foreign countries. So we respected that.

Also, I wanted to thank the observation of the Secret Service with respect to the bill, which is what we are having a hearing on our side. Mr. Leach and I have cosponsored this bill, and I think Secret Service has a good point in saying that one of our sections would create an additional, later bureaucracy to the powers and responsibilities that the Secret Service already has. And I have always been very much against any kind of duplication of that effort.

So also over in the Senate we have some bills that, in effect, have been introduced that would do what I am very happy to say is not being done, and that is a recall of currency or any evaluation or anything like that. So that the only other thing was the occurrence reported on June 17 of the Bureau of Engraving and Printing theft which was very embarrassing to the Bureau, $1.7 million by an individual, Robert P. Schmitt, Jr., and it was detected. It had been reported because of the inordinate deposit of monies by this individual, and so the authorities were on top of that, the Secret Service was on top of it, and I am very happy to compliment you, because you were way ahead of the CIA. It took how many years to get their own agent, and if they had done the same kind of checking that was done with this Treasury official, why they would have had a quicker revelation. In any event, I thought the record ought to show that, because it was brought out in the hearing.

We want to thank you very much for your patience. You are a great help to this committee, and we will be in communication with you as we proceed in the legislative process.

I am going to advise the next panel that as soon as I go register my vote, we will come back and pick up with them. But thank you very much, gentlemen and lady.

Mr. NEWMAN. Thank you, Mr. Chairman.

[Recess.]

The CHAIRMAN. The committee will please come to order.

Our second panel consists of Mr. Glenn T. Sincerbox, chairman of the Committee on Next-Generation Currency Design of the National Research Council; Mr. Robert J. Leuver, executive director with American Numismatic Association; and Mr. Maurice Weissman, chairman and chief executive officer of the U.S. Banknote Corp.

I would like to point out to Mr. Leuver that I had the great pleasure of running into the chairman, I believe, of the American Numismatic Association who is here this morning. I don't know if he is in the audience. Oh, there he is. And he was gracious enough to give me a copy of his book.

Mr. FRANK. Mr. Chairman, was it worth less than $20, I hope? Because I don't want Common Cause to make a citizen's arrest on you while you are presiding.

The CHAIRMAN. Well, it was new; it wasn't used, but it was paperback, and I think it was less than $20.

Mr. FRANK. Then you are all right.

The CHAIRMAN. Well, we will recognize—unless one of the witnesses has any time problems or constrictions, I will recognize you in the order that I introduced you and begin with Mr. Sincerbox.

STATEMENT OF GLENN T. SINCERBOX, CHAIRMAN, COMMITTEE ON NEXT–GENERATION CURRENCY DESIGN, NATIONAL RESEARCH COUNCIL

Mr. SINCERBOX. Thank you, Mr. Chairman, members of the committee. My name is Glenn Sincerbox. I am a program manager at the IBM Almaden Research Center in San Jose, California. I am pleased to have this opportunity to brief the House Committee on Banking, Finance and Urban Affairs on the results of a study that I recently chaired for the National Research Council on counterfeit deterrent features for the Next-Generation Currency Design. The Research Council is the operating arm of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine, chartered by Congress in 1863 to advise the government on matters of science and technology. This study began in 1992 when the Department of Treasury's Bureau of Engraving and Printing requested that the National Research Council, through its National Materials Advisory Board, analyze and recommend overt counterfeit deterrent features that could be incorporated in the redesign of U.S. currency.

The major objectives of this study were to analyze and recommend new overt counterfeit deterrent features that can be incorporated into U.S. currency in the short term, intermediate term, and long term; and, assess technological directions of future reprographic techniques that could be used by professional counterfeiters.

A committee of 12 volunteers with expertise in advanced reprographic technology, chemistry, color, optical science and engineering, paper, physics, security marking and systems engineering was formed. The committee met six times between June 1992 and June 1993. Invited presentations by experts from industry and government provided data relevant to the production and inspection of banknotes, advanced reprographic technology, and advanced counterfeit deterrence features and methods.

For the sake of brevity, I will restrict my remarks today to the major findings and recommendations of the committee. Additional information regarding counterfeiting threats, feature description and assessment, deterrent strategies and advances in reprographic technology can be found in the report.

Traditional counterfeiting deterrents, such as unique high-quality paper, fine-line engravings and high-pressure intaglio printing, were adequate in the past to restrict counterfeiting to the dedicated craftsman with access to a printing press; these have kept counterfeiting to a reasonably manageable level in the United States. However, with the advent of advanced reprographic systems, such as color copiers and scanner, computer, printer systems, these methods are no longer sufficient. Widespread availability of these systems, the reproduction quality, ease of use and relative freedom from discovery combine to create an atmosphere for occasional casual counterfeiting; a crime of opportunity. These systems also provide a convenient base technology for the more professional counterfeiters so that they need only concentrate on simulating the deterrent features and not on the engraving and printing process. The counterfeiter's task is made easier by a public in the United

States that, for a variety of reasons, does not appear to aggressively examine its banknotes and report counterfeit bills.

Placement of new, nonimpact color copiers and printer systems in 1995 is expected to exceed 2 million units in the United States, and a similar number is expected for the rest of the world.

The amount of counterfeit notes produced using nonimpact reprographic technology is currently small, in contrast to those used by lithographic processes. The rate of growth, however, is geometrical. Counterfeiting on a larger and larger scale would cause severe problems for the economy, as well as impacting the ability of law enforcement agencies to respond. Fortunately, appropriate actions can be taken long before counterfeiting becomes a problem of such proportions.

Over the course of this study, technical information about numerous deterrent features was gathered from vendors, expert witnesses, the Bureau of Engraving and Printing, the Federal Reserve Board, and the Secret Service. This information ranged from conceptual proposals with little or no supporting data to prototypes with extensive test results. A limited amount of data were also available for features already in use on the currencies of other countries.

The overall effectiveness of an individual feature was determined by two primary considerations: Resistance against technical threat and technical success probability.

Resistance against technical threat assumes success in deploying the deterrent and is a measure of the feature's value as a counterfeit deterrent. This category was subdivided into four subcategories: Visual and tactile recognizability, and inherent resistance to copying, resistance to simulation, and the ease of machine readability.

Technical success probability is a measure of the risk of incorporating a feature in a banknote. This category is also subdivided into four subcategories to identify the primary areas of consideration. These are availability and manufacturability, change to recurring production costs, durability, and capital cost of new or modified production tooling.

The two categories with their eight subcategories form the cornerstone of the committee's evaluation by helping identify the relative strengths and weaknesses of each feature.

The committee did not expect that any single feature would rank first in all of the categories, and indeed, none did. Hence, the committee thought it was important to understand the intent of each deterrent. In order to provide a multifaceted system of deterrents, consideration should be given to deploying multiple features that complement each other. A well-designed set would address issues of visibility and recognizability under different viewing conditions; require different methods and skills for simulation, and generally require too many additional process steps for anyone but the most dedicated professional to attempt. Some caution is required, however. The use of too many features could overwhelm the public and thereby reduce the overall effectiveness of the deterrents.

Features that defeat the casual counterfeiter do not necessarily work effectively against professional counterfeiters. Casual, opportunistic counterfeiters do not have the skills, resources, or deter-

mination to defeat sophisticated individual deterrents or combinations of them, whereas professional counterfeiters do have these skills and the resources to simulate or duplicate any single deterrent, and probably most combinations, given sufficient time. Certain combinations of features, rather than features acting alone, offer robust potential for defeating the casual counterfeiter and slowing down the professional. In the committee's opinion, the set of deterrent features need not be the same on all denominations of banknotes.

Based on these and other findings, the committee has made several recommendations.

Although there are many features that can be used to deter counterfeiting, the Bureau of Engraving and Printing should continue to utilize fine-line engraving, intaglio printing on high quality pale-tinted paper and the security thread as methods of deterrence against classical printing technologies and present-day reprographics.

The BEP should implement a system of complementary features on each banknote that creates added complexity for simulation by all levels of counterfeiters. In the near term, the committee recommends incorporation of at least some of the following visible features: Color-shifting inks for printing, moire or alias-generating line structures with color added as necessary to enhance the effect, security thread modifications, that is, the location or widths based on denomination; variable size dot patterns with color added to enhance the effect; and localized watermarks.

For the intermediate term, features requiring inexpensive visual aids for detection at the point of sale are recommended. These include infrared inks for printing; optically active coated fibers and particles embedded in the substrate; and photoluminescent inks for printing.

Longer term plans for advanced deterrents should include additional development and understanding of the following features: Diffraction-based holograms and related devices; embedded zero-order diffraction gratings; laminated paper substrates with selected features; metallic or specular woven security features; optical fibers embedded in the substrate; and random pattern encryption methods.

There are other aspects of a counterfeit deterrent strategy that should be developed along with incorporating new features in banknotes. To begin with, counterfeit detection identification should be emphasized for point of sale persons as a priority and should be available to the public at large. Potential incentives that would encourage the public to turn in counterfeiters should be closely studied to learn which would be effective and not subject to abuse.

Industry should be encouraged to develop effective point of sale aids to assist in banknote authentication. Efforts that will lead to a high degree of authentication, particularly for high denomination bills, should be continued.

The Department of Treasury should investigate the cost-effectiveness of requiring source identification such as machine serial numbers to be embedded in images produced by new copiers and printer systems that are capable of producing quality color counterfeit banknotes. If it is determined to be cost-effective, appropriate U.S.

legislation requiring source identification should be encouraged. In addition, the Treasury Department should strongly encourage the use of sensors built into color copiers and printer systems that can recognize and inhibit banknote copying.

To stay ahead of the evolving counterfeiting threats, the Department of Treasury should establish a multiphased program of identifying and evaluating advances in relevant technologies. Understanding the technological progress and nonimpact printing technologies and which counterfeiting techniques and methods are being employed would help the Department of Treasury anticipate in advance the sophistication level of counterfeiters so that the type and timing of counterfeit deterrents could be planned accordingly. Appropriate mechanisms to accomplish this task can take the form of advisory panels, committees, workshops, and briefings.

Finally, the Department of Treasury should continuously gather data from other nations as to the effectiveness and durability of features, such as color shifting inks and holograms that have been incorporated into their currency.

Mr. Chairman, members of the committee, thank you for the opportunity to summarize our study. I have attempted to provide you with an overview of our major findings and recommendations and hope that you have found my presentation informative. I will be happy to assist you in whatever way I can should you require additional detail.

The CHAIRMAN. Thank you very much. That is excellent help.

Mr. Leuver.

STATEMENT OF ROBERT J. LEUVER, EXECUTIVE DIRECTOR, AMERICAN NUMISMATIC ASSOCIATION

Mr. LEUVER. Mr. Chairman, in World War II Operation "Bernhard" conscripted Jews from Nazi concentration camps to counterfeit British currency. About $600 million in counterfeited British pound notes of various denominations were used by the Nazis to purchase arms in Eastern Europe and to undermine the economy of Great Britain. However, during the Revolutionary War, the British counterfeited the Continental currency, which won the epithet "not worth a continental." In recent months there have been operations counterfeiting United States currency allegedly in Colombia, Italy, and Lebanon's Bekka Valley, the latter with the assistance of national governments. The purposes have been to support drug operations, to purchase arms, and to undermine the U.S. currency.

Mr. Chairman, and other distinguished Members of the House of Representatives, Banking, Finance and Urban Affairs Committee, it is a pleasure to appear once again before you to testify on currency and counterfeiting. I do appreciate the invitation. As you acknowledged at the beginning, I am the executive director of the American Numismatic Association, a congressionally chartered organization, to further the collecting of currency, coins, and other forms of money. However, I am also the former Director of the Bureau of Engraving and Printing. I am accompanied, as you acknowledged at the beginning, by ANA Governor, Anthony Switech of New York, and I probably should mention by my 10-year-old daughter, Mary Ellen, whose mother is from Laredo, Texas, by the way.

Counterfeiting of currency is an insidious act, and I would like to talk a little bit about that today. I would ask that my written remarks be entered into the record, and I will speak off the record—not off the record, but I will comment on those written remarks.

The CHAIRMAN. If you will yield to me, let me say that each one of your written prepared testimonies will be in the record as you gave them to us. So in fact, it would be, given the lateness of the hour, desirable if you would summarize, because your entire written statement will be in the record exactly as presented to the committee.

Mr. LEUVER. Thank you. As I acknowledged, counterfeiting of currency is an insidious act. If the magnitude is great enough and if it is underwritten by governments, it is an act of aggression against the integrity of the United States. And if the magnitude of counterfeiting is extensive and pervasive, it could well be the World Trade Center catastrophe for international U.S. relations.

As was acknowledged by the speakers in the first panel, U.S. currency as designed in the 1920's is extremely susceptible to counterfeiting. Except for the plastic security thread and microprinting introduced in 1990, changes since its introduction have been minor. Improved technology in the field of graphics, however, has now tipped the scales in favor of the counterfeiter.

As a stable, international currency, the U.S. dollar is an excellent monetary device for purchasing arms and drugs. We have acknowledged that the U.S. Secret Service does an excellent job of monitoring and prosecuting counterfeiters in this country. However, I found it very interesting, in listening to the comments of Mr. Caputo, that there have been different ranges of currency that has been intercepted from Europe. Really, the Secret Service has no way of telling how much currency is actually in circulation in the foreign country.

I have just returned from the Mint Director's Conference in Helsinki and over this past weekend I had the Ambassador of Slovakia and members of the Central Bank of Slovakia as my guests in Colorado Springs. And they spoke of the $120,000 that had gone through their small central bank in the past year, some of them with counterfeited $100 bills and the new note was counterfeited, the one with the magnetic—with the stripe in it. Although they could not read what was on the stripe, they did have the plastic stripe in that currency. The microfitting around the portrait was just a straight line, but to the naked eye it appeared as if it were microprinting.

So we find more and more of our notes circulating throughout the world.

A year ago this past May I was down in South America and visiting the security printers in that country, of which there are four, Chile, Argentina, Brazil, and Colombia, to discuss machinery to print currency. However, quite truthfully, most of our time was spent talking about the counterfeits of U.S. currency which circulate in their country and what could be done about it. In Helsinki, again last month, I was approached by a member of the Reserve Board or the Central Bank Board from Slovenia, and he asked me, what were the counterfeit deterrents in U.S. currency.

It was his function as a member of the Board to instruct the cashiers at the Central Bank. And I said I would be happy when I got home to call the Treasury Department and obtain the brochures that they give to foreign banks. His statement was, I already have copies of those, but it is so simple to counterfeit your currency, there must be other deterrents in those notes that they are not telling us about. And I had to tell him quite truthfully that what he read was entirely what we have to combat counterfeiting.

I think one thing that struck me as odd during the testimony preceding this, that almost every member said that the United States was not going to recall or demonitize currency. I might say you protest too much. I guess I can say this now, no longer being a member of the Treasury Department, but they spoke about it so much and so often, that they must have given a great deal of thought to the concept.

As the former Director of the Bureau of Engraving and Printing, quite truthfully I would seriously give consideration to a recall or demonitization if the counterfeiting problem, the drug problem, or whatever is associated with it is that great. However, I must say that as executive director of the American Numismatic Association, if there was a recall or demonitization, it would send a chill down my back, because that would cause many dealers and collectors to lose many valuable documents.

There was a U.S. bill that was demonitized. It was a $10,000 gold note series of 1990. What happened was there was a fire at the Postal Service down here on 12th and Pennsylvania, and in order to not—to quiet down the fire, if you will, or to get rid of part of the hazard they started throwing these $10,000 notes out the window. They were already canceled, and subsequently, so that the bills would not be turned in again for—to be redeemed, they were declared no longer to be value—they were declared to be valueless and nobody was allowed to retain them. I have seen copies of them, but I sure wouldn't bring one today with the Secret Service here.

A couple of things very quickly in summation. Probably, one of the most notable things that came out of Mr. Sincerbox' study was that in any counterfeit deterrents that you put into notes, and I was listening to what Mr. Kennedy had to say, that there has to be a rationale that joins the various deterrents together. So that if you defeat one, another one will rise up to bite you.

There has to be both a relationship between the various deterrents and there has to be some sort of a match. The chart was over there before. I am afraid that what I saw was not the fact that there was this relationship. I am not sure how to overcome that, but I think that the Treasury Department ought to make sure that they ensure the fact that the various deterrents that they have are wed to each other, that they form a whole rather than being specific pieces.

One thing that I would like to comment on is that in filling the pipeline, a tremendous amount of notes are going to have to be printed. One of the factors that came up was the cost of currency. It used to cost us 1.9 cents to print currency, and this was approximately 10 years ago. We are talking today of 3.8 cents according to the testimony.

Pete Daly, the Director of the Bureau, said that the new deterrents are going to add one penny to currency. We will now become the most expensive currency, I believe, in the world at 4.8 cents. And that begins to disturb me. I guess I would advocate to this committee at this time that they actually consider not printing the $1 bill which constitutes 47 percent of our currency. That would give the Bureau the capacity to print new currency and remove a very expensive item from the budget.

I would also seriously consider legislation that we had offered in the past to consider the elimination of intaglio on the reverse side of all of our bills. The purpose being that intaglio, the first side of the bill to be printed is the reverse side. As that bill is entered into a press for the second printing, the BEP pressure is 6,000 pounds per linear inch. It actually crosses the intaglio that is printed on the back. The Treasury Department has offered legislation regarding that many times.

I think if you would take a $10 bill from your pocket and look at the back, you are going to find that there is a tin lizzie pictured in front of the Treasury Department. That tin lizzie represents currency designed in the 1920's for the reprographic technology that was foreseen in the 1930's, and that was over 60 years ago.

It is time, first, to get rid of the counterfeit problems in tin-lizzie currency; second, to move forward with a new design for currency that will meet the counterfeit threat for today and the next 25 to 30 years; and, third, determine what strategy will be used to replace the current currency with the new; fourth, make money-saving changes to currency production.

Mr. Chairman, it has been a pleasure to appear again before you and members of this distinguished committee. I would be happy to respond to any questions at any time.

[The prepared statement of Mr. Leuver can be found in the appendix.]

The CHAIRMAN. Thank you very much, Mr. Leuver.

Mr. Weissman.

STATEMENT OF MORRIS WEISSMAN, CHAIRMAN AND CHIEF EXECUTIVE OFFICER, U.S. BANKNOTE CORP.

Mr. WEISSMAN. Mr. Chairman, members of the committee, I am pleased to appear before you today to discuss the private sector security printing industry and to provide an overview of some of the anticounterfeit deterrent features used by our company and our operating subsidiaries in the manufacture of currency for countries worldwide.

In addition, I would appreciate the opportunity to contribute constructive thoughts on some of the important issues that our government faces with the development of this new generation of U.S. currency.

I have also brought samples for members of the committee to better illustrate some of the specific counterfeit deterrents that are available today and are used in the marketplace throughout the world.

I would like to introduce two individuals that are here with me. At my left is Robert Christophersen, our executive vice president

for manufacturing; and in the front row is our new president, Ron Glover, chief operating officer.

It is important to draw a clear distinction between the currency operations of our company and the Department of Treasury's Bureau of Engraving and Printing. While both organizations have very similar technical capabilities—from world-class engravers and highly trained and skilled craftpersons to state-of-the-art intaglio presses—we serve a variety of customers. The Bureau of Engraving and Printing serves one customer and only prints one currency. In fact, many press-persons now employed by the Bureau of Engraving and Printing served their apprenticeship with us.

We must print in a highly competitive environment. Most of the work we do in the currency area is won by competitive bid. We must have the latest state-of-the-art technology available to the many countries we serve.

We are no stranger to printing of U.S. currency. Prior to the Bureau of Engraving and Printing filling the role as the Nation's currency printer, our subsidiary company, American Banknote, printed currency for the government since 1795.

We have printed currency for over 100 countries throughout the world. Attached to my statement today is a list of some of the countries we have printed for since we have been in business.

Our holographic subsidiary is a world leader in holography. We have worked to perfect secure holographic devices for today's sophisticated currency and currency substitutes. Probably, everyone in this room is carrying one of our holograms if you have a VISA or MasterCard. That same technology is available today for currency.

The first rule of thumb in developing a secure bank note is the use of multiple anticounterfeit features, usually a combination of overt and covert ones. This is much more effective than simply using one or two. The more features, the more difficult to counterfeit. The utilization of sophisticated overt features provides for quick, accurate, on-the-spot visual authentication. Public awareness of security features is increasingly important as an anticounterfeit technique.

The second rule of thumb in our banknote community is to stay ahead of the counterfeiter. With time and money, virtually any single anticounterfeit feature can be duplicated or at least simulated in a fashion that would be accepted by the average person.

It is this second rule that makes the combination of several sophisticated anticounterfeit, overt and covert, features an absolute necessity in today's environment.

With the increasing sophistication of color copier technology, as was described here before, we continue to develop new anticounterfeiting techniques, one of which is found in the three-dimensional holographic counterfeit stripe. The package we have provided you contains a sample of holographic windowed thread.

We have also provided a number of other samples of holograms on banknotes. Today, a number of countries have utilized holograms on banknotes. To name a few, Finland, Austria, Switzerland, and Canada. The number is growing by leaps and bounds.

The new generation hologram has great depth and significant movement. And I expect that these new holograms will be used by

the VISA and MasterCard issuers in the not-too-distant future. That new technology is available today for banknotes and it is available in a very cost-effective manner. The four deterrents regularly used by our company in currency production include design, paper, inks, and printing technology.

A truly secure currency starts with the design process. It is at this point where design elements such as single or multicolor complex images are combined to create an overall note design that is extremely difficult to separate, scan, or copy. Accurate front-to-back registration of the note design is also an important counterfeit deterrent feature, and is initially established during the design process.

The foundation of banknotes is the substrate, or the paper. In addition to the inclusion of counterfeit deterrents, substrate durability is also a feature we pay close attention to, and wherever possible, recommend a cylinder mould-made sheet, the most durable currency paper available.

Cylinder mould-made paper provides for the employment of truly effective, visually apparent anticounterfeit features, including localized multidimensional cylinder mould-made watermarks that are sized to be visually apparent and recognizable, preferably the same subject as that printed on the note, and a windowed security thread that is wide enough to place a recognizable holographic three-dimensional image with good color shift. As mentioned earlier, the package we provided you contains some samples of windowed holographic thread that was put in the paper during the papermaking process.

Other available features are visible and invisible multicolor fibers incorporated in the sheet. The options for ink as a counterfeit deterrent are several: Multicolored selectively inked and engraved intaglio images that are optically variable can be used to enhance images on one note; serial numbers can be printed with a penetrating ink so as to ensure that the paper fibers retain the ink. Further examples of ink technology that exist today and are currently being developed for use on currency include photochromatic inks that change color under ultraviolet light, as well as the use of ink-sensitive inks which change color with the warmth of a finger.

It is clear that intaglio is the preferred method of printing. However, an image can be placed on the banknote which, when viewed from an angle, shows another image or text. Other technologies include split fountain printing, which provides a rainbow effect and blocking patterns, which will drop out when attempted to be color copied.

Holography is also a printing technology that today produces a recognizable three-dimensional image which can move or change color or show depth when viewed at different angles.

Security of raw materials is vital. Every supplier of our company must follow the same strict audit procedures that we follow within our own company, and that is that every single piece of paper is tracked, recorded, and accounted for.

A secure banknote must incorporate multiple anticounterfeit features. However, the most viable guard against counterfeiting are the elements that by their very presence or absence are immediately obvious and recognizable by the average person. It is not

enough to put features on a banknote that are so hard to detect that the average person is not aware of them.

As a result, and from our experience, there are four features that we strongly recommend: A multidimensional cylinder mould-made watermark; a windowed holographic security thread; a color-shifting ink in an especially noticeable area; and an enlarged latent image incorporated in the working of the bill which would be easily noticed.

The watermark and the windowed holographic thread would be incorporated in the substrate at the papermaking process. The color shifting ink and latent image could be contained in the printed portion of the note. In our view these options add the greatest security and could be implemented immediately.

While these additions may generate some incremental increase in cost, they would not add any capital expense to the government for any new equipment. In addition, they would not require research and development costs, as the technology exists and can be put into currency immediately.

In conclusion, I would like to commend the individuals with the Department of Treasury, Bureau of Engraving and Printing, Secret Service, and the Federal Reserve for undertaking the task of redesigning our currency. The process is never easy.

The announcement made today is a good start, but we cannot afford to stop. We must continue to think about advanced technology. We in the private sector stand ready to assist the government and any of its consultants to support further consideration of counterfeit-deterrent features.

It is my pleasure to be here today. I thank you, and I would be delighted to answer any questions that you have.

[The prepared statement of Mr. Weissman can be found in the appendix.]

The CHAIRMAN. Thank you very much, Mr. Weissman, and the other witnesses for your most valuable testimony that you submitted to the committee.

I had some questions. I will start with Mr. Sincerbox. While the use of the so-called planchets on the surface of a currency is an easily detectable deterrent feature, is it not true they are also relatively simple to duplicate?

Mr. SINCERBOX. Not by a copier or a scanner printer combination, which would be the primary systems we would want to defeat; those used by the casual counterfeiter. You would have to go to an extra, overt step to simulate this type of deterrent feature.

The CHAIRMAN. We had heard some statements made about the fact that it would be. Do you believe the Department of the Treasury selection of deterrent features is consistent with the findings of your committee?

Mr. SINCERBOX. Yes, I do. I was very pleased to see, in fact, that several of the recommendations we have made have been incorporated into their plans for a new design, and also some of the procedures that they want to put in place for future efforts.

The CHAIRMAN. The witness has stated to the committee that Treasury had already looked over all of the different recommendations, including your research, and they had come to the conclusion that the selections that they had reduced it to were the wisest and

the most feasible and prudent. So you are satisfied that they did incorporate a good cross-section of your main recommendations?

Mr. SINCERBOX. Yes, I am very satisfied.

The CHAIRMAN. Mr. Leuver, I have so many things that rush through my mind's memory that are associated with this whole area, currency and coinage. In my native city of San Antonio, in my district, was the scene of—if not the only one, certainly one of the first minutes in the United States when it was still under Spanish rule, the de la Garza mint. You are familiar with that. And, incidentally, it was also the place where the last private bank, which went out on the death of this great gentleman representing a great family in San Antonio, named the Oppenheimer family. It was the last private bank in the United States to finally expire after his expiration which was just a few years ago.

So there is a lot of association in my mind with the currency and coinage and the history attached to it. But as the former director of the Bureau of Printing, can you comment or do you have any comment or thinking as to why past administrations have been slow to adopt substantial or even, if you like, dramatic changes in design?

Mr. LEUVER. Yes, I think the answer is relatively simple. It wasn't only the administration, but we have to remember that the chairman of a subcommittee of the Banking Committee, was very much against change.

The CHAIRMAN. I am a veteran and I am scarred with the redesign of the coinage, as you well remember.

Mr. LEUVER. Yes, I have been through that with you. But I think even when we talked about currency change, I will never forget on one of the sessions that you were at, the chairman started this whole talk, and I think I was the last witness that day of 12 witnesses, but he started the whole session off by saying there is one person in this room that knows how hard it is to change either currency or probably knows more about the difficulty of changing the design in currency and coins than anybody else in this room, and he was talking about me, because of the times I had talked to him and testified regarding the change in the currency.

But the perception is that the public will not like change, and that happened when I approached Secretary Baker, when the head of the Secret Service and I approached him to change it. Actually, designs went as far as the White House when Don Regan was the Secretary.

And as I say, the subcommittee of this committee was also against change, again because of the perception of the public. But I would like to remind the committee—and I wish Ted Alison from the Federal Reserve were here. He would have been here today but I understand he has been out of town for 2 weeks, that led their effort over the years. Ted is a senior official of the Federal Reserve Board.

But anyway, they conducted a study with a large national firm to study and to gauge the perception of people regarding currency or a change in design of currency. And I think there were two conclusions.

Maybe I should insert in there as a side-bar, the Treasurer of the United States, officials of the Secret Service, the Federal Reserve,

myself, and other members of the Bureau, attended one of these sessions in Baltimore, Maryland, and we came back with a conclusion that was mirrored across the country: That people are, first, against change, but if they feel that our currency is threatened, then they are interested in a change, and they don't care how dramatic that change might be.

The CHAIRMAN. That is interesting. Well, I am going to ask indulgence for 2 additional minutes of my colleagues here. I am going to follow through a chain of thought, also related to your testimony and Mr. Weissman's.

First, I think when you use—and the previous panel used a word, "demonetize." Isn't that what we did in 1965? We had the $2 silver note that went out that year.

Mr. LEUVER. We ceased to print them but we didn't demonetize them. To demonetize means they no longer have value. You can still redeem those notes.

The CHAIRMAN. They are still redeemable?

Mr. LEUVER. Yes.

The CHAIRMAN. But not in silver.

Mr. LEUVER. Not in silver, no.

The CHAIRMAN. I don't want to deprive anybody here. I am going to go ahead if we have time later.

Mr. McCollum.

Mr. MCCOLLUM. Thank you, Mr. Chairman.

I appreciate the witnesses being here.

Mr. Sincerbox, obviously, much of our research and effort has gone into what is going to be implemented now by the Treasury Department. That seems very clear. But there is a feature of this that is a little disturbing to me, only in the sense of the scope of what is being done.

In your testimony—and I am quoting from it—I heard you say it, I think, in oral testimony as well, you say, "Features that defeat the casual counterfeiter do not necessarily work effectively against professional counterfeiters," and you go on to say that "casual, opportunistic counterfeiters do not have the skills to defeat sophisticated individual deterrents or combinations of them, whereas professional counterfeiters do have these skills and the resources to simulate or duplicate any single deterrent and probably most combinations given sufficient time."

I think what is being done today, and I want to corroborate it. If these changes are made, we are making a really significant change to deter people who are going to photocopy these bills to that kind of casual reproduction. But if we are dealing with a foreign government which is hiring the best professionals to reproduce these bills, whatever we are doing today is not going to be good enough. Maybe in the short run it will complicate their life, but not well enough.

Am I reading you correctly? Would you comment on that? Will the efforts being made by the Treasury Department announced today be good enough to stop, let's say, the Government of Iran, assuming that it is actually producing fake $100 bills, from being able to get away with that?

Mr. SINCERBOX. You are completely correct. The intent of the committee and our study was to really develop a feeling for the fea-

tures that could be incorporated in currency to thwart the casual counterfeiter, the person that is going to lay $50 on a copier and have a good weekend, and will not really attempt to go to additional steps to simulate additional features on the banknotes. And that could be done with today's currency.

And so the features that you heard today, the security thread, the watermark, the optical variable ink, the moire patterns, are all designed to address those kinds of issues. Obviously, a dedicated, professional counterfeiter with unlimited resources can hire Ph.D.s and do any number of advanced technologies themselves. And so, given time, they can simulate at least, if not duplicate, whatever features are introduced.

About the only thing you can do to currency that would thwart the professional counterfeiter would be to encrypt various types of features using an encryption code. But, however, that would not help the man on the street, because he needs something that is visible for him to quickly discern whether the $20 or $50 he accepts is bogus or not.

Encryption would be a more covert feature, if you will, and require at least some form of machine assistance for authentication.

Mr. MCCOLLUM. My understanding is that much of the problem with the $100 bills that are fakes are from overseas, and the equipment in some of the foreign countries is better at detecting in the covert sense than other equipment is.

If we adjusted that, as you say, with the type of design change you proposed as possible, does that not help those foreign governments better to detect through their central bank some of the bills?

Mr. SINCERBOX. I think a professional counterfeiter will be able to duplicate or simulate just about any feature except those that require encryption keys or things like that.

Mr. MCCOLLUM. Mr. Leuver, you have just heard what Mr. Sincerbox had to say, and I greeted your testimony with great skepticism about the question of whether or not we have really a big problem abroad. It sounds to me that you are suggesting we consider recall, that we consider the kind of demonetization as a possibility here, that you may have a personal view, you have not expressed it here today.

Do you believe that we have a problem? Do you believe that governments like Iran are producing fake $100 bills with resources that can overcome the kind of changes we are making today in such a way that this is going to require something more dramatic than simply a changing of the printing process that we have had described today?

Mr. LEUVER. I won't say we are there right now, but I would say that the potential exists that they can actually severely hurt our economy.

I would agree with Mr. Sincerbox in everything he said. However, when we are dealing with a foreign government, and I have studied this counterfeiting issue, the length of it, for many years, and seen what countries have been able to do to other countries.

Now, if a country gets in and starts using their technology, they have the same technology that the United States has. They have people as equally well trained as we have in the United States whereby they can counterfeit our currency and counterfeit any

changes that we make to our currency. And as a consequence, I think the potential of hurting us economically is extremely great.

Mr. MCCOLLUM. Do you believe we should at this point in time be considering recall or demonetization?

Mr. LEUVER. I guess I would say we should not cast it aside so quickly. We may have to do that.

Mr. MCCOLLUM. You think the seriousness of the problem may be that great abroad, you are just not privy to all the details?

Mr. LEUVER. That is correct.

Mr. MCCOLLUM. But there are red flags, I guess we say in the law.

Mr. LEUVER. Yes, because I travel internationally probably every 6 months or maybe less. I talk to people in central banks. And I see a tremendous problem that is overseas. They always speak to me about the problem of counterfeiting currency because they know I was former Director of Engraving and Printing.

But I would like to say one thing to Mr. Weissman's testimony, and Bob Christophersen to whom you were introduced, we are very good friends, and I think the counterfeit deterrents that they were talking about are exceptionally good. You try and get as many deterrents as you can into your substrate, and that makes it extremely difficult for a country to try and duplicate those particular types of deterrents, because they are much narrower than the ones that you can put on with the technology through printing or through engraving and things like that.

Mr. MCCOLLUM. So what you are saying, if I get this correct, is that we have gone X distance today with the Treasury changes that Mr. Sincerbox and his crew helped develop; those are positive, they have helped us with the casual reproduction.

B, we ought to go next, at least from what I hear you saying, to what Mr. Weissman is suggesting we might be able to do and that would throw a little kink in some of the professionals, but you are not sure based on your testimony that even that would do it, because the problem appears to be rather alarming in size and potential, but you don't know enough to tell us how widespread.

Am I correct? Is that a fair assessment?

Mr. LEUVER. That is pretty fair, at least the conclusion is. But I do think the study that Mr. Sincerbox conducted and the testimony that you heard from Mr. Weissman, that they both spoke of additional technology that could be introduced in U.S. currency which would make it extremely difficult for even the professional to duplicate.

Mr. MCCOLLUM. But it hasn't been done yet.

Mr. Chairman, the last thing I would like to request, we can talk about it later, but I just think this testimony right now indicates more than ever before that we ought to try at least talk to Mr. Caputo or somebody in executive session, see just how fully this problem exists out there. I don't think we know that.

The CHAIRMAN. As I said before.

Mr. Deutsch, Mr. Frank yields.

Mr. DEUTSCH. Thank you, Mr. Chairman.

I would like to follow up on a couple of things. One is the process by which the recommendations were made.

Mr. Sincerbox, it sounds like you spent time and tried to do a thorough analysis. Did you have direct correspondence with foreign countries about what they are doing, or with private sector people like Mr. Weissman who are trying to do these anticounterfeiting things directly, in your analysis?

Mr. SINCERBOX. We had input from numerous directions. A lot of the input about what foreign countries are doing came from the Bureau of Engraving and Printing and also from the Secret Service. We had testimony from private sector representatives as to the various counterfeiting features that they propose or recommend, and the results of their testing. So it was quite exhaustive.

Mr. DEUTSCH. Are you aware, or are any of you aware of foreign countries' use of the private sector to actually do printing? How often does that occur? Have you considered this approach.

Mr. SINCERBOX. I don't have any knowledge of that.

Mr. DEUTSCH. Mr. Weissman, can you respond to that?

Mr. WEISSMAN. I believe that most countries in the world do not print their own currency. That is not in quantity of banknotes, but in numbers of countries. The private sector prints and designs currency for governments

Certain countries like Germany, for example, have both the government and the private sector print their notes. Canada does not print its own notes. Our business is designing and printing notes for countries throughout the world.

Mr. DEUTSCH. Mr. Chairman, this is clearly something that I think is within this committee's jurisdiction. We ought to be thinking about what role the private sector can have in terms of this issue, and at least thinking about the approach used by other countries that have the same problems that we do.

Now I would also like to follow up on some of the things you talked about, Mr. Weissman. You talked about holograms in currency. There are a number of countries that do that today?

Mr. WEISSMAN. Yes. Kuwait just put a hologram on one of its banknotes. We have proposals in discussion with at least 10 countries for adding a hologram or thread. We are talking about the same hologram, but one is a thread and one is not. The advantage of a thread is that it is applied at the papermaking process, which is very, very controlled.

The equipment that the Bureau has is readily available to any country in the world. In fact, China has just placed a major order for sophisticated printing equipment. Russia has. Iran has the equipment.

As Mr. Leuver pointed out, any country that prints their own currency can print U.S. currency. So that if you apply something at the papermaking process where it is controlled, where the inventory is controlled and not at the print process, you have a great advantage. That is why a lot of samples we have shown you are the holographic thread that is applied at the substrate level.

Second, the hologram today is becoming—there is a public awareness of it visually. That has come from a lot of the credit card usage, a lot of secure labeling. And it is a great visual feature. People can recognize it.

The new generation, not the 2-year-old generation or even the year-old generation, the new generation of hologram is very, very—

almost impossible to counterfeit or replicate because of the depth we are able to get, because of the computerization of the hologram, and because of the movement where the image actually moves.

Now, that same thread with that on it can be put into the papermaking process. If I am correct, I believe Crane supplies all of the paper for the Bureau. So it is controlled. So if you put that on at the papermaking process and Crane is the supplier, or there are two suppliers, there is an accountability process. I think that is what Mr. Leuver was pointing out.

Mr. DEUTSCH. We have made the distinction between the immediate, midterm, and long term. What is the timeframe that you believe this could be done if it was——

Mr. WEISSMAN. The holographic thread is available immediately.

Mr. DEUTSCH. Mr. Sincerbox, you were not speaking of that, though. If I recall your testimony accurately, you were talking about long term.

Mr. SINCERBOX. Yes, we were talking about the holographic image as a long-term device as opposed to the thread. The issue here is while the holographic image works well on a rigid substrate, there are certain issues that need to be understood when you put it on a flexible substrate such as currency. A substrate that is subjected to chemical and other type of physical abuse.

Mr. DEUTSCH. What about the thread issue; do the same concerns you have deal with the thread as well, not just the image?

Mr. SINCERBOX. It depends on whether or not there is an image on the thread. To me the durability of the thread would be a major issue. That was why it was really placed in a longer term category, to study the issues of durability.

Mr. DEUTSCH. Mr. Chairman, if I might, I have just one final question. Have you, Mr. Weissman, had direct interaction with the Bureau on hologram usage at all?

Mr. WEISSMAN. We submitted some holographic features about 2 years ago, and received an order for some quantity of development samples. Since that time we have not had any substantial feedback.

Mr. DEUTSCH. Thank you, Mr. Chairman.

The CHAIRMAN. Mr. Frank.

Mr. FRANK. I apologize because I missed part of this. If I am being duplicative, please tell me and we will pass over it. But I am curious, if this is so easy, how come it happens so rarely? That is, let me go back.

You gave two examples, Mr. Leuver, of counterfeiting for political purposes: Germany and the British in 1780. Does it happen more regularly? Have we any way to tell? Why, if it is relatively easy, has there not been more currency warfare?

Mr. LEUVER. There actually is. Murray Bloom from Long Island is the author of a book, and I don't recall the exact title.

Mr. WEISSMAN. I think it is entitled "The Color of Money?"

Mr. FRANK. The title is not important. We will look it up later. Go ahead.

Mr. LEUVER. Actually, this has gone on for years.

Mr. FRANK. If it has gone on, I understand it could go on at the level of people wanting to benefit from it. But I am talking now from the standpoint of it becoming destabilizing, causing economic

problems. I don't know, maybe—we do have some private citizens who are in the business of eating up our currency; namely, the presidents of the Federal Reserve Bank. Maybe there are private citizens who are inflating the currency to deal with the private citizens who have decided when they could deflate it.

But is there evidence in American history recently of counterfeiting having any significant negative economic effect on us?

Mr. LEUVER. I won't say we have had a severe economic effect, but during the Second World War the Bureau of Engraving and Printing had to overprint all the notes that were issued in Hawaii with the word "Hawaii" on it because the Japanese were replicating those notes and distributing them already in the Philippines.

Mr. FRANK. But not since then. That was part of an all-out war.

Part of the problem, it seems to me, to get away with that you would have to not only be very good at it but be very good at concealment, because in some ways it is like germ warfare. I would think America's capacity to flood Iran with currency would exceed Iran's capacity to do ours.

You have described something that is relatively easy to do and you have to wonder, if it is so easy to do and there are some obvious advantages to do it, how come so little of it has been done?

Maybe now they decided to do the yen instead to get a better bang. But I wonder if the ease of deterrence is a weapon like germ warfare that a country would be very reluctant to wield.

Mr. LEUVER. Officials from Arthur D. Little spoke to us when I was still with the Bureau about the potentiality that they felt of currency, of counterfeit U.S. currency circulating in countries where we really had no control. That would be in the Eastern Bloc countries, the Mediterranean countries, and the Near East, the southern Mediterranean, northern Africa.

Mr. FRANK. Tunisia, Algeria?

Mr. LEUVER. Right.

Mr. FRANK. But, apparently, there is no evidence that has been done, I gather.

Mr. LEUVER. I think there is. I think that is what was alluded to before, whether it is $12 billion, $120 million, whatever they are talking about, these various amounts of money that are circulating in Lebanon.

Mr. FRANK. That is from the standpoint of people trying to finance drugs rather than doing it to destabilize the United States. There are several issues. I just want to get a sense of which——

Mr. LEUVER. There has always been a great fear that Libya would begin to counterfeit money—they, fortunately, do not have the presses—that they were trying to counterfeit our currency to destabilize the United States. It is very easy for these countries to do it.

Mr. FRANK. I am inclined to think it is not as easy as you think, because if it was so easy, some of them would do it. I don't think Qadhafi has held off out of a sense of restraint. So there are, obviously, some factors at work that deal with it.

Just one other question. You have said that you thought we should stop printing $1 bills. Would we do coins instead?

Mr. LEUVER. Yes, sir.

Mr. FRANK. We would have $1 coin instead of a bill.

That is all, Mr. Chairman. That is enough for me.

The CHAIRMAN. I want to thank you very much, Mr. Frank.

Unfortunately, when the second panel is up all the TV cameras leave from the first panel. They have to sit through the lunch period and whatnot, and I always regret that, but I don't know what we can do otherwise.

I want to point out to that collection there in that frame on that easel, I don't know if you can see it, but that is mine. It was given to me, and it has most of the industrialized nations, European. And if you notice the English or the British, who does their printing?

Mr. WEISSMAN. The Bank of England.

The CHAIRMAN. But they, as of about 10 years, 11 years ago, made a decision to every 5 years change the design for the very purpose of flustering counterfeiters.

Mr. WEISSMAN. Many countries do that periodically. Every few years they change the design of their notes.

The CHAIRMAN. So that all of this questioning about, well, what are you going to do now here in the United States, is at best temporary. Well, they all are, as you said.

It is the same thing as in the case of economic controls. I am a liberal, and in 1971 everybody was surprised when I voted against wage and price controls—the Economic Stabilization Act. And I said, well, I am a child of the Depression and of the war and I remember when we had controls during the war. And even those in time of war were evaded, because you have to follow the dictum of Cohen's law. Cohen's law maintains that every control you formulate, there shall always be one way of evading it or another.

To each superimposed control there will be a way to evade it. The same is true in the case of currency. But that collection is very interesting, because it shows you the difference in the size of the picture, which, if I am not mistaken, Mr. Weissman, is one of the best means——

Mr. WEISSMAN. Yes, the portrait is the most recognizable feature. It is interesting to note that some of the notes you have in your collection have been redesigned already.

The CHAIRMAN. That is right.

Mr. WEISSMAN. Yes, the new notes are only a couple of years old.

The CHAIRMAN. That is right, sir. But the British have an established 5-year period.

Mr. Frank, also you brought out a very interesting point, but it wasn't put this way. I put it this way. Sure, some of these nations that when we get in times of stress we have to demonetize, the Nazis during the war, now the Iranians and the Iraqis, may manufacture their own, but it is only the conquerors that can impose the coinage and the currency.

In 1945, as soon as we conquered Germany, one October night there were about 12 U.S. Army trucks that went up to the—at that time it was known as the Reichbank, and they carted to the 12 different points, we later called it the West Terminal. And those trucks carried our manufactured new deutsche marks that were going to be exchanged at the rate of 10 for 1.

So, actually, today's deutsche mark is really our designation. But it was the Reichmark. Everything was—the Reichstag, not the Bundes. But it is the conqueror that does it. So the Japanese con-

quered the Philippines. If they could find a way to counterfeit some American currency for whatever purposes, they would, because they had control of that.

But as long as Iran doesn't run amok and conquer, I think you are right. I think we have it easier to try to subvert their currency than they would have us.

But one thing I wanted to do before this was over, Mr. Leuver, at the outset of your testimony you seized on the previous witness' representation about how they were not demonetizing and they were not devaluing, and you said, well, they protest too much.

I think in all fairness to them, because we had extensive staff exchanges, if they did it was because they wanted to avoid what possibly your insinuations about demonetizing currency would do, and that is it would play into the conspiratorial mind that feels that the administration is trying to hide some big crisis. And I think it is implied in some of your statements that you are suggesting a greater crisis and impact on the economy, which I noticed just a few minutes ago you said, well, maybe it wasn't that substantial.

But I think we ought to clarify that and say I would ascribe on the basis of their discussions in anticipation of preparing their testimony for us that that was what they wanted to avoid most of all and that this was not going to in any way directly or indirectly feed those who would try to give and cast a different aspect to the reasons for these necessary changes that have too long been delayed.

I did think it would only be fair. They are not here, and I do know that they said that, because they wanted to make sure, the Federal Reserve witness and the others at the Treasury, for that reason, that they didn't want to necessarily convey a sense of alarm or that things were out of control.

The other thing I think it is important for us to bring out, in view of your stressing the additional cost of the note or the currency, Mr. Weissman, I was going to look—here, on page 7 of your testimony you say, "Cost: Most banknotes printed by United States Bank, not corporation, have a different cost per note, a cost that is determined largely by the security features incorporated in design, printing, techniques, and raw materials, particularly paper and ink. In many cases there seems to be a little rhyme or reason as to the criteria used for some of our international customers in determining the reasonable cost for a note."

In view of Mr. Leuver's statement that it seems this additional penny in cost—I imagine—my interpretation is that you feel it is excessive.

Mr. LEUVER. No, that wasn't the purpose. I was just saying that when you get up to 4.8 cents per note, that is a very expensive note, and I thought that we ought to consider the elimination of the $1 bill which constitutes 47 percent of our total production as a cost-saving device.

The CHAIRMAN. What is the net cost of printing the $1 note as compared to the $1 coin?

Mr. LEUVER. That has been given in other testimony. I don't have that in front of me, that I could give you that kind of a figure. But a $1 note only lasts approximately 16 to 18 months in circulation as opposed to a $1 coin, which will last for 15 or 16 years.

The CHAIRMAN. About 4 years ago I came out with the thought that we ought to substitute a $1 coin for the $1 note, first because of the difference in cost, and also longevity, but mostly because we could then benefit from the seigniorage. Therefore, the benefits derived from seigniorage would go to funding a type of community bank.

Mr. LEUVER. The seigniorage on a $1 coin would be a considerable amount of money, sir.

The CHAIRMAN. At that time we were given an estimate of better than $300 million, or more than that.

Mr. LEUVER. That was a figure I vaguely recall.

The CHAIRMAN. So this is most valuable testimony to have, because I haven't given up on the idea. I have a whole kit of lost causes. I don't see any reason I shouldn't put one more in there.

Mr. FRANK. Mr. Chairman, if I could just follow up. I appreciate it. I was sorry I wasn't here earlier.

I was struck, and I guess this was touched on earlier, because I am concerned sometimes about us being alarmists unnecessarily, and it did strike me as you think about the vast size of the American economy today, the enormous amount of money that is involved, including cashless transactions, but the vast amounts that are in various accounts, that the notion of a fairly small country seriously destabilizing our economy by the physical printing of cash, I become more and more convinced that that would be awfully hard to do given—frankly, Mr. Chairman, especially some of the things you have done to put into law, restrictions on large amounts of currency. If you could do it $10,000 at a time, it is going to be pretty hard to destabilize America's economy.

I was interested to note that Mr. Kelly and Mr. Newman said counterfeiting is a crime and a problem but not a macroeconomic problem of the United States. And I don't want people to be sort of alarmists about that.

The other thing I would say, Mr. Leuver, you said maybe they are thinking about demonetization because they protest too much. I have to be honest with you, saying that doesn't seem to me to say very much. People like yourself have suggested demonetization. For Federal officials to say they are not going to do it doesn't seem to me they are protesting too much.

I have always felt when people say the evidence for something is that other people have denied it, they haven't really said anything. Shakespeare was very gifted and in his particular situation, remember, he created the situation in which he decided someone was protesting too much. I just want to say I don't think there is any basis for your inference that because they have said no, once again, I would hope people would not come away with what would seem to me to be the wrong impression.

Authorities are convinced there is no macroeconomic threat whatsoever from this, and therefore are not prepared to undergo the kind of difficulty that demonetization would cause, and that the remedy in fact lies in the kind of physical changes which I think there is probably a broad consensus of support for.

Thank you, Mr. Chairman.

The CHAIRMAN. Thank you.

I didn't quite complete, but I was going to ask Mr. Weissman for a comment on the cost, the additional cost.

Mr. WEISSMAN. First of all, from a private sector perspective, it seems odd to me that a $1 note would have the same cost as $100 note. Since all of our notes are all identical in terms of size and color.

So would you say, Mr. Leuver, in your experience the $1 note is costing the same as a $100 note, except for the thread?

Mr. LEUVER. No, I think there is a difference in the cost of the notes, but if I recall the Bureau's costing practice, they cost all notes at the same price. It, obviously, costs more for a $100 note to be printed because it spends less time on press, there is a changing of the plates and things like that.

Mr. WEISSMAN. But based on paper and ink usage and speed of press, would you say it is the same cost?

Mr. LEUVER. Fairly much.

Mr. WEISSMAN. My point is, you don't need the same security in a $1 note and you shouldn't spend on average as much money for a $1 note as you would for a $10, $20, $50, or $100. Most countries don't.

When we print a series of notes for a country, the least expensive note is the lowest denomination. I believe, and I agree with Mr. Leuver, when you get up to 4½ to 5 cents per note you are in the stratosphere of cost of currency. But it is not necessarily the additional penny for the new features mentioned today that should be scrutinized.

We have to start with the basic 3.8 cent average, that may be too high. We have to look at the basic note itself.

Following Mr. Leuver's suggestion, perhaps some of the security that is on the $1 note should be taken off to lower the cost of it. I don't think we have a counterfeit problem at the $1 level and therefore consideration should be given to reducing the printing costs by printing the back side of the note using offset technology. You don't need intaglio on both sides of the $1 bill. Since the $1 bill is in circulation only 16 or 18 months the expense of intaglio printing on both sides may be unnecessary.

The CHAIRMAN. I was also interested, you just referred to intaglio. Did you not say, Mr. Leuver, that you were suggesting that that be dispensed with?

Mr. LEUVER. That is correct. That is what he is quoting.

Mr. WEISSMAN. Right now both sides of the notes are intaglio printed. Certainly, on a $1 bill you could print one side intaglio to save costs and reduce the overall costs of that bill.

The CHAIRMAN. Poor old George Washington. All he got was a $1 note. Which side would you do that on?

Anyway, do you have any other questions, Mr. Frank.

Mr. FRANK. Yes. But I am trying to understand what intaglio is. I will get that later.

The CHAIRMAN. Don't ask me either.

Anyway, we have held you here so long. I have some questions but I will submit them in writing because they are susceptible to a more proper reply in writing.

[The information referred to can be found in the appendix.]

The CHAIRMAN. Gentlemen, thank you very much for your extreme patience and your great cooperation. It has been most helpful.

The committee will stand adjourned until further call of the Chair.

[Whereupon, at 2 p.m., the hearing was adjourned, subject to the call of the Chair.]

APPENDIX

July 13, 1994

Opening Statement of Henry B. Gonzalez, Chairman
Committee on Banking, Finance and Urban Affairs

Hearing on the Redesign of the Currency

July 13, 1994

We are here today to discuss one of the most underrated, yet important issues facing our financial future -- the well being of our currency. As the world's predominant medium of exchange and store of value, the resiliency of the dollar is constantly challenged and is frequently under attack from dubious forces such as counterfeiters and money launderers. We must protect the dollar's standing as the world's foremost currency. Our financial future depends upon it.

To illustrate the dangers of neglect, imagine a scenario whereby the U.S. dollar's value is undermined by large scale counterfeiting, and there is a surge of demand for deutsche marks or yen. Our nation's coffers would soon empty as we tried to purchase enough foreign currencies to satisfy our massive external debt. In short order, the U.S. would be bankrupted.

Many experts believe the U.S. dollar is in no imminent danger. However, in international trade, the dollar continues to lose ground to the yen and the deutsche mark. In fact, since 1985 the dollar has lost well over 50% of its value against the yen alone, and it has taken a similar fall against the deutsche mark. We must become more vigilant in protecting our currency.

A vital means of protecting our currency is to adopt a worldwide anti-counterfeiting program. For years I have championed efforts to improve the relatively simplistic design of the Federal Reserve note to stay ahead of the new technology available to counterfeiters. Unfortunately, the Reagan and Bush Administrations were slow to act. Then-Secretary of the Treasury Nicholas Brady, turned down the Committee's request to initiate more dramatic anti-counterfeiting efforts to increase the security of the currency. Since that request, the counterfeiting of U.S. currency abroad has increased four fold. Today we will hear how the initiatives adopted by the Clinton Administration will protect the greenback.

At a minimum, changes in the design of the currency must provide practical deterrence against both current and possible future counterfeiting schemes. I applaud the Department of the Treasury for adopting changes in the design of the U.S. currency to include more sophisticated counterfeiting deterrent features.

In addition to the Treasury action in redesigning our currency, the Federal Reserve must do more research on where and why our currency is held overseas. The Federal Reserve now estimates that 60% of our currency is held overseas, but they do not have precise statistics to show where it is held, and how it flows through the arteries of our international financial system. More needs to be done to understand these factors.

There is also a dearth of information on how the massive foreign holdings of our currency affect monetary policy. As we have witnessed in the past several months, if people lose faith in the dollar, certainly our monetary policy will be affected. Yet the Federal Reserve denies any strong link between foreign currency holdings and monetary policy. Surely that is a dangerous position, and I will continue to urge the Federal Reserve to learn more about the why's and where's of the overseas holdings of the dollar. I look forward to hearing from today's witnesses and thank them for their cooperation.

For Release upon Delivery
Expected at 10:00 a.m.
July 13, 1994

STATEMENT OF FRANK N. NEWMAN
UNDER SECRETARY OF THE TREASURY
DOMESTIC FINANCE
BEFORE THE COMMITTEE ON BANKING, FINANCE AND URBAN AFFAIRS
U.S. HOUSE OF REPRESENTATIVES

Good Morning Mr. Chairman and members of the Committee.

I am pleased to be here today to discuss the Treasury's plan for promoting the security of U.S. currency into the future. With me from Treasury are Mary Ellen Withrow, Treasurer of the United States, Peter H. Daly, Director of the Bureau of Engraving and Printing, and Guy Caputo, Deputy Director of the U.S. Secret Service, in addition to Governor Edward Kelley of the Federal Reserve. At Secretary Bentsen's direction, I serve as chairman of the interagency Advanced Counterfeit Deterrence Steering Committee, composed of the Treasury bureaus and agencies represented here today and the Federal Reserve System. The committee has been operating since 1982 to assure effective cooperation among the parts of the government responsible for stewardship of our currency system. Last year, Secretary Bentsen charged our committee with prompt analysis of trends and alternatives for responsible action by the Treasury Department.

This morning, Secretary Bentsen announced that the Treasury

Department is undertaking a comprehensive program to modernize the design of U.S. currency. We are here today to outline the rationale, objectives, and approach to that program, and to respond to your questions about it.

First, Mr. Chairman, I would like to express our appreciation for your leadership on this issue in recent years. Your support has been most valuable as we have developed programs to protect our currency from future counterfeiting threats.

As you know, the dollar is a de-facto world currency. About 2/3 of the $350 billion of U.S. dollars in general circulation is being used outside of the United States. This reaps economic benefits to the United States because the interest-free currency notes issued by the Federal Reserve support a corresponding level of interest-earning assets. Most of the Federal Reserve's annual interest income is then paid to the Treasury. As Governor Kelley will explain in more detail, this value has been running in excess of $15 billion a year for the U.S. Treasury.

Because of its enduring value and world-wide acceptability, the dollar will always be a target of counterfeiters. At this time, however, counterfeiting does not pose a significant threat to our economic well-being or our monetary system. The amount of counterfeit currency passed in the United States each year is less than one one-hundredth of one percent of currency in circulation, and the diligent efforts of the Secret Service have meant that most counterfeit bills

are never even passed to the public. Nevertheless, as advanced computer based reprographic technologies continue to evolve, the deterrent features of our current currency will become increasingly less effective. As a result, we must take steps now in order to address a threat that will increase as technology improves. That is what our program is all about - attacking the future technological threat before it fully evolves.

Secretary Bentsen has authorized the final development and testing of a set of new counterfeit deterrent features that will significantly increase our currency's defense against reprographic technologies. These features have been taken from an inventory studied by the National Academy of Science and augmented with research by the Bureau of Engraving and Printing. Furthermore, the Bureau studied the currencies of other countries not only for an assessment of their security features but also for insights into their production and circulation requirements. These insights were helpful for our development program. The special large scale production and circulation characteristics of U.S. currency made the implementation of certain of those features impractical; however, our new design incorporates a number of the most advanced and effective technologies used anywhere in the world.

The new features authorized for testing and development include changes in the paper, ink, and design of currency notes. Major among them are an enlarged off-center portrait on each denomination, a

matching watermark, an enhanced security thread, and microprinting in the design and on planchettes embedded in the paper. There are also interactive patterns which turn into irregular, wavy moiré patterns when copied. In addition, a variety of covert but machine-readable features will be added for banking system use. We expect a production design to be finalized in 1995, and we should be ready to issue new design $100 bills about a year later. Pete Daly and Tom Ferguson from the Bureau of Engraving and Printing will present the features and plan in more detail.

We would like to call your attention to several points concerning the security aspects of this program:

1. The program is an orderly, pre-emptive plan to protect U.S. currency from counterfeiting which could be facilitated by advancing technology.

2. The new design features work in synergy, as a system. No single feature alone can provide enough counterfeit deterrence to withstand the technological threats we expect will develop in the future.

3. Because the technology available for counterfeiting is evolving, no longer will U.S. currency be as static in design as it has been. Therefore, elasticity must be built in now to accommodate the inclusion of new deterrents and

the discontinuance of those that lose their effectiveness as the paths of technology develop.

4. The combination of overt features will augment the ability of merchants and the public to more readily identify genuine notes, thereby strengthening our front-line defense against counterfeiting. At the same time, the covert features will aid Federal Reserve processing and add another level of security.

5. The plan is cost effective and not disruptive to existing cash processing system or world use of the dollar.

6. The plan is not a response to a crisis;

it is not a response to any current counterfeiting case.

It is a responsible, forward-looking, preventive program.

It is clearly in the best economic and political interest of the United States to have a freely circulating currency relied upon everywhere as a symbol of strength and a trustworthy medium of value. However, it also makes our currency a prime candidate for illicit use and a favorite target of counterfeiters. Despite this, world confidence in U.S. currency remains extremely high, and, as undesirable and serious as counterfeiting is, it does not now pose a

serious problem for our currency system. However, there are no absolutely counterfeit-proof documents, and there will undoubtedly be continuing attempts to counterfeit U.S. dollars with the use of modern technology. We need to strive to stay ahead of that curve with high security currency features. The proposed features necessitate some design changes, but the traditional look of U.S. currency will be largely maintained. The size, national symbols, and colors will be the same as they are now.

Before concluding, I should touch on some approaches that were explicitly and unanimously rejected by our committee and by Secretary Bentsen. There have been suggestions that perhaps the U.S. should demonetize and recall its existing currency and issue a new one. The objective would be to flush out hordes of cash, and disrupt various money-laundering methods associated with tax evasion and drug trade. Other suggestions have been made for separate domestic and international versions of U.S. currency.

Our committee considered these ideas and concluded that they are not viable options, and would be overreactions to the situation as we now know it. The United States has never recalled or demonetized any of its currency and will not do so now. Such an act would touch on highly sensitive international issues and work against the larger economic interests of the United States by disrupting the beneficial world reliance on the dollar.

We do recognize that, since existing currency will continue to be valid, we need to continue counterfeit detection and enforcement programs with them in mind. The Secret Service has an outstanding record in this regard, and Mr. Caputo will explain more about that ongoing program. In addition, the Federal Reserve will continue to destroy older bills that pass through the banking system, so that, over time, the vast majority of bills in use will be of the new design.

Treasury believes that the necessary strengthening of the security of our currency can be achieved in an orderly way over the next several years with the introduction of a new generation of currency. This will keep us ahead of the technological curve, add important assurance for the integrity of our currency domestically, and help assure that the dollar will continue as a currency of choice around the world.

My colleagues and I will be happy to respond to any questions members of the committee may have.

For Release upon Delivery
Expected at 10:00 a.m.
July 13, 1994

STATEMENT OF MARY ELLEN WITHROW
TREASURER OF THE UNITED STATES
BEFORE THE COMMITTEE ON BANKING, FINANCE AND URBAN AFFAIRS
U.S. HOUSE OF REPRESENTATIVES

Good morning, Mr. Chairman and members of the Committee. Thank you for this opportunity to testify before your committee on the redesign of U.S. currency.

We are here because of the importance of protecting the integrity of U. S. currency, and because the changes to the currency which we are considering will further the continuing efforts to maintain that integrity.

The U. S. dollar has come to symbolize the strength and stability of our country and the integrity of our economy. It actually serves as a world currency, and is vital in that role. To maintain this status, U.S. currency must be protected against the threat posed by modern technology. But if the changes we are recommending are to be effective, they must also be universally recognized and understood by the public. Throughout the world, the new style notes must be as readily recognized and accepted as the present design.

As you know, Mr. Chairman, some enhancements already have been successfully introduced into U.S. currency. These include the security thread and microprinting seen in the Series 1990 notes. However, compared to these changes, the enhancements in the new currency will be dramatic -- the first change in the basic appearance of U.S. currency in 65 years. This makes the issuance of a new design of U. S. currency especially momentous and the mission of public education critical.

The public must be reassured that previous versions of our currency are still valid and will not be recalled: U. S. currency has never been demonetized and will not be demonetized in this case. This message needs to be underscored well in advance of the release of the first notes with the new design. In this way we can assure confidence and continuity in the handling of U.S. currency and avert public confusion as we change to the new design. To maximize public acceptance and to minimize any confusion, the new currency will maintain many traditional American elements. The new currency will maintain its current size and colors, with portraits of the same historical figures on the faces and the same buildings or monuments on the backs.

Putting forth this information to the public will require a world-wide education campaign. The effort will be headed by the Treasury, with representation from the Bureau of Engraving and

Printing and the Secret Service, as well as the Federal Reserve Board.

The scope of this effort will be even broader than the campaign to introduce the 1990 series. Effective methods of explaining the new features must be identified. Multi-media materials must be prepared, translated into the major languages of the world and sent out for distribution worldwide. Bank tellers, cash handlers, enforcement and forensic agents must be trained to distinguish the new currency, and to feel confident in its recognition. By the time the new design is issued, the public must be well aware of what it will be seeing and know how to use the new features.

Moreover, this is not likely to be the last change in our currency design. In the future, more frequent changes will be required, to meet the threat of advances in technology, and each change will necessitate further public education. Therefore, this campaign will set the stage and provide a model of operation for future efforts.

Mr. Chairman, we are confident in our decisions for the new currency design. We are equally confident in the public information campaign. Through the campaign, we will be able to introduce the new design to full advantage and to assure the world that our currency, whether the old design or the new, is secure

and sound. I am pleased and honored to act as Treasury spokesperson for this campaign.

Thank you for this opportunity and I will be happy to answer any questions you or other members of the committee may have.

For Release upon Delivery
Expected at 10:00 a.m.
July 13, 1994

STATEMENT OF GUY P. CAPUTO
DEPUTY DIRECTOR
UNITED STATES SECRET SERVICE
BEFORE THE COMMITTEE ON BANKING, FINANCE AND URBAN AFFAIRS
U.S. HOUSE OF REPRESENTATIVES

Good morning Mr. Chairman and members of the Committee.

I appreciate the opportunity to appear before this Committee and testify on a topic which I believe to be of utmost importance. Today's announcement of the new currency design represents a significant step forward, and the Secret Service is pleased to have played an active role in the development of the program. Commencing in 1865, the Secret Service has played an integral part in the investigation and suppression of counterfeit United States currency. While certain of the techniques used in that investigative mission have changed, the commitment on the part of the agency to maintain the integrity of our currency has remained constant. Just as our methodology has been periodically revised, so have the instrumentalities and techniques utilized by the criminal element involved in the counterfeiting of United States currency. Access to a variety of technologically advanced equipment, has resulted in a significant increase in the general quality of counterfeit currency.

As the Committee is aware, the counterfeiting of our currency is

not restricted by our territorial boundaries. To the contrary, we have seen a significant increase in counterfeit activity abroad. As an example, in fiscal year 1993, in excess of $120 million of counterfeit U.S. currency was seized abroad. In contrast, domestic seizures and counterfeit notes passed on the public accounted for $44 million. The increased extra-territorial activity is attributed to factors which include, but are not limited to, worldwide acceptance of United States currency; the processes by which U.S. currency may be replicated; technological advancements in the field of reprographics; the ability to easily transit most countries; and the inherent problems associated with multi-jurisdictional enforcement.

While overseas counterfeiting activity continues to receive significant media attention, we must not lose sight of the fact that domestic counterfeiting violations also must be addressed in an aggressive manner. In fiscal year 1993, the Secret Service suppressed 127 counterfeit plant operations domestically, while arresting 1,899 individuals for counterfeit related violations. During that same period, the conviction rate exceeded 95%. Based on data for the first six months of fiscal 1994, suppression of domestic counterfeit plant operations and arrests are projected to increase once again. These enforcement statistics attest to both the current level of criminal activity and the need to maximize investigative efforts in that same arena.

The results of enforcement initiatives may be more easily measured

than deterrence efforts. The Secret Service utilizes a variety of methods designed to minimize an individual's or group's potential for success in a counterfeit related scenario. As an example, we have long maintained liaison activities with commercial vendors who provide printing supplies and/or equipment to the public. There is ongoing coordination among and between a variety of domestic, foreign, and international law enforcement entities, which is designed to ensure, and therefore enhance lines of communication. The emphasis which is placed on liaison has proven to be an invaluable tool in the investigation of counterfeiting. Individuals and groups involved in counterfeiting activities, both domestically and abroad, continue to evidence multi-jurisdictional and/or international activity. In order to aggressively investigate those involved, it is necessary to effectively mobilize available resources. Consistent with that initiative, the Secret Service continues as a proven communication catalyst for authorities involved in the suppression of counterfeiting.

The Secret Service's mission, as it relates to the counterfeiting of United States currency, is straightforward. As a Bureau of the Department of the Treasury, our deterrence program is directly linked to efforts on the part of the Treasury to ensure the integrity of our financial system. The currency redesign program specifics presented here today provide significant overt and covert deterrence features for incorporation into our currency. The success of our investigations is directly correlated to our ability

to identify counterfeit activity promptly. The overt features will allow for easy recognition by the public, which will in turn help facilitate that process. The covert features will augment machine readability and facilitate Federal Reserve currency processing.

I would like to emphasize that from an enforcement point of view, the integrity of United States currency is dependent upon a two pronged approach; i.e., enforcement and deterrence. The efforts are not mutually exclusive, rather they are co-dependent. While enforcement efforts are routinely reactive, security enhancements are deterrents, which when incorporated into currency design provide a proactive approach to counterfeit suppression.

The efforts on the part of the Treasury Department, and in particular the Advanced Counterfeit Deterrence Steering Committee and the New Currency Design Task Force, have been significant. The results of their involvement and commitment are in evidence today. There is now an increased awareness of future technological advancements which will necessitate a continuing program of currency redesign. Be assured that the Secret Service remains committed to the mission and takes pride in its continuing ability to make a significant impact on the problem as well as the solution.

Again, thank you for this opportunity to appear before the

Committee, and to emphasize the strong support of the Secret Service for the new currency program. I would be happy to answer any questions you might have.

For release on delivery
10:00 A.M. EDT
July 13, 1994

Testimony by

Edward W. Kelley, Jr.

Member, Board of Governors of the Federal Reserve System

before the

Committee on Banking, Finance and Urban Affairs

U.S. House of Representatives

July 13, 1994

Thank you for the opportunity to present the Federal Reserve's views on the Treasury Department's plans to further protect U.S. currency from the threat of future counterfeiting. I have attached to my statement responses to the questions raised in your letter of invitation. I would request that they become part of the record. My remarks this morning will focus on the reasons the Federal Reserve fully supports the design improvements being considered by the Treasury.

Counterfeiting is foremost a serious crime--but one with a special dimension. For if counterfeiting were to take place in very large volumes, it might undermine public confidence in the genuine currency and might, in extreme circumstances, also threaten the Nation's economic stability. For these reasons, our government must be ever alert to opportunities to improve both its enforcement of anti-counterfeiting laws and the design of its currency.

The United States has the benefit of a vigorous, and highly effective, enforcement of counterfeiting laws by the Secret Service. We have also had a largely effective currency design, particularly with the addition in 1991 of two additional security features aimed at reducing the threat of color-copier

counterfeiting. Thanks to good law enforcement and to a good design, as well as to a watchful public, the current level of counterfeiting activity is on the order of only $20 million per year passed on the public in the United States, or only about 10 cents per capita. Thus counterfeiting has no discernable impact on the overall economy and places no constraint on the formulation or implementation of monetary policy.

Nevertheless, the security features of the current design probably are not adequate to deal with the counterfeiting threat of the future, which seems likely to be dominated by rapidly improving reprographic technologies, especially computer-based scanners, printers, and copiers, that will be available to large numbers of people and that will require little operator skill. We are also concerned about increasingly sophisticated counterfeiting by dedicated criminals; and by a greater proportion of this activity taking place outside the United States. Accordingly, the Federal Reserve strongly supports the Treasury Department's efforts to incorporate additional security features to currency now, in order to be better prepared for the threats of the future.

To provide some context for the Committee's consideration of this design-improvement effort, I would like to comment on three related matters: (1) the importance to the Treasury and to taxpayers, in financial terms, of the Federal Reserve's currency-issue function (2) the worldwide role of United States currency and

therefore the importance of maintaining worldwide confidence in it, and (3) steps that the Federal Reserve might take to ensure prompt distribution of the newly designed notes.

Currency issuing is highly profitable for governments because the issuance of non-interest-bearing central bank currency liabilities gives rise, correspondingly, to comparable holdings of earning assets by the central bank. The Federal Reserve System's balance sheet shows currency liabilities, and corresponding earning assets, of about $357 billion. At a portfolio return of about 5.3 percent in 1993, the assets associated with currency outstanding generated some $18 billion in gross income for the Federal Reserve System and therefore accounted for most of the approximately $16 billion of 1993 net Federal Reserve earnings paid to the Treasury.

The needs of the domestic U.S. economy, however, do not account for all, or even most, of the $357 billion dollars of Federal Reserve notes in circulation. Our currency is widely accepted and used outside the United States, and in a few countries even plays a leading role as a substitute for the domestic currency. We do not have hard data on the amount of currency held abroad, and estimates are necessarily imprecise. Research by the Board's staff indicates that probably over half, and perhaps in excess of 60 percent, of the $357 billion of U.S. currency may be in use outside the United States. Evidence also suggests that the

percentage of U.S. currency held abroad has tended to increase in recent years. The worldwide demand for our currency contributes in a very important way to the direct financial benefits that taxpayers derive from the issuance of Federal Reserve notes--perhaps to the extent of 60 percent or $10 billion annually, of the approximately $16 billion earned through currency issuance. In effect, by holding our currency, citizens of the rest of the world are making an interest-free loan to the United States.

We cannot take for granted the choice of U.S. currency as both a store of value and a medium of exchange in countries whose economic or political situations make their own currencies less attractive for those purposes. There are other currencies and other instruments that would serve the purpose. The choice of U.S. currency is most of all a consequence of the esteem and confidence in which the United States government, its political traditions, and its economic performance are held. Whether that esteem and confidence are maintained in the future depends primarily on the fiscal and monetary policies that are pursued here over the long term. The preference for U.S. currency abroad, however, and the associated financial benefits, also depend on confidence in the Federal Reserve notes themselves and could be diminished by widespread concern about the genuineness of U.S. currency.

Against this background, the Federal Reserve is preparing now for the challenges of active distribution of the newly designed

notes when they become available and a prompt replacement of the Federal Reserve notes currently in circulation--on a worldwide basis.

Let me not be misunderstood, however. The Federal Reserve would not support, and has no plans for, a recall, demonetization, cancellation, or any other cessation of legal tender status of United States currency. All genuine United States currency now in circulation, whenever issued, is legal tender and should continue to be legal tender.

For replacing Federal Reserve notes in circulation within the United States, it is likely that the Federal Reserve will follow the general approach we have used in issuing the Series-1990 $100s, $50s, $20s, $10s, and $5s, which as you know provided improved counterfeit deterrence in the form of a security thread and microprinting.

In the case of $100s and $50s, which have an average life of more than 5 years, we knew that we would need to replace the outstanding Federal Reserve notes more promptly than on a business-as-usual basis. For those denominations, as soon as the Bureau of Engraving and Printing had shipped a sufficient inventory of Series-1990 notes to each of the Federal Reserve Banks and branches (which was in August 1991 for $100s and in February 1992 for $50s) the Federal Reserve began paying into circulation only the 1990-

series notes. That is, all pre-1990 $100s and $50s deposited at Federal Reserve Banks were withdrawn from circulation even if their quality level might ordinarily have permitted their reissuance. As a result of that procedure, Series-1990 notes now comprise over 80 percent of the receipts of $100 and $50 notes at Federal Reserve Banks and therefore over 80 percent of the general domestic circulation of those denominations.

Series-1990 notes of the $20 and $10 denominations were first paid into circulation by Reserve Banks in October, 1992, and November, 1992, respectively. Since those denominations have an average life of only 2½ to 3 years, the Federal Reserve has retired the pre-1990 notes on a business-as-usual basis; that is, they are withdrawn only when they are judged to be too worn or soiled for further circulation. As a result of this procedure, we have achieved a replacement rate comparable to that of the $100s and $50s. Series-1990 notes now comprise about 60 percent of those denominations in deposits at Federal Reserve Banks and therefore in general domestic circulation.

For replacing Federal Reserve notes used outside the United States, a more active approach may be required for the newly designed series. In contrast to the 80-percent replacement rate domestically, we estimate, for example, that only 50 percent of the $100s circulating abroad and only 65 percent of the $50s abroad, are Series-1990 notes. Even though these lower replacement rates

may to some extent be attributable to the 1990-Series not being visibly very different from the earlier series, and the more visible changes in the newly designed notes may generate a greater public demand for them, the present replacement procedure may not be considered sufficient for the newly designed notes. The Federal Reserve is therefore considering the benefits and costs of a number of available options for expediting the replacement of notes that are outside the United States when the newly designed notes become available. No decisions have been made, except that there will be no recall or demonetization of existing currency.

In conclusion, I would like to thank the Committee for this opportunity and again, let me reiterate that the Federal Reserve fully supports the design improvements being considered by the Treasury. It would further the interests of the United States to enhance its currency by making it as secure from counterfeiting in the future as it has been in the past.

Attachment 1

Responses to Questions Provided by the Committee

1. According to figures provided to the Committee by the Federal Reserve and the U.S. Secret Service, the confiscation and detection of counterfeit notes represents less than .048 percent of the amount of currency in circulation. From a strictly statistical standpoint, it appears that the number of counterfeit notes is insignificant and a redesign of the currency is unnecessary. Do you believe this to be the case? Please explain.

As stated previously, counterfeiting has no discernable impact on public confidence in U.S. currency or on the overall economy. Thus, the current level of counterfeiting is insignificant from a macro-economic perspective. However, counterfeiting at any level is unacceptable to society. The security features of the current design may not be adequate to deal with the counterfeiting threat of the future (see page two of the testimony). Since the focus of currency redesign is on emerging technologies, the Federal Reserve strongly supports the Treasury Department's efforts to add additional security features to currency now in order to be bettered prepared for the threats of the future.

2) What is the Federal Reserve's role in the detection of counterfeit notes and the issuing of the new currency?

Thanks to a watchful public, most counterfeit notes are discovered before they reach the Federal Reserve System. In recent years, the banking and retail sectors have detected 75 to 80 percent of all counterfeit notes, while the Federal Reserve finds the remaining portion. Since the Federal Reserve stands as the last line of detection for counterfeits, we expend considerable resources and exercise due diligence in inspecting currency. In 1993, the Federal Reserve detected over 108 thousand counterfeits or 25 percent of all counterfeit notes passed on the public. All suspected counterfeit notes found by the Federal Reserve System are turned over to the Secret Service for a final determination of authenticity.

As stated in the testimony, the Federal Reserve is preparing for the challenges of an active distribution of the newly designed notes and a prompt replacement of the notes currently circulating. The Federal Reserve plans to follow the general approach used in issuing the Series-1990 $100s, $50s, $20s, $10s, and $5s (see page five of the testimony for details). It is important to remember that, although all financial institutions may order from and deposit currency with the Federal Reserve System, only 38 to 40 percent typically choose to do so. Currency is distributed to the remaining savings institutions, banks, and credit unions through larger financial institutions, armored carriers, and other private sector entities.

3) The Federal Reserve estimates that for 1993, approximately 62 percent of the currency outstanding was held outside the United States. How are these estimates determined? Please estimate this figure for each of the past five years.

Since currency can easily be carried in and out of the country and there is not a reliable count of the currency crossing the border, it is difficult to know how much currency is in the United States or abroad. Federal Reserve staff have tried to develop models that can answer the basic question of how much currency is overseas. The research is not yet completed and it is difficult to say what the ultimate findings will be. Various approaches have been tried and the answers vary. The research project that is furthest along suggests that well over half of the currency is abroad and this fraction has generally been increasing over time. Nonetheless, the various approaches to estimating the flow of currency abroad do agree on one matter: the net flow of currency abroad has been up sharply in the 1990s, perhaps averaging as much as $20 billion per year (or about 80 percent of the average increase in the currency component of M1).

4) What percentage of notes suspected of being counterfeit by the Federal Reserve's currency processing systems, indeed turn out to be counterfeit? What similar characteristics do authentic notes that are selected by the systems as being counterfeit share? Are you able to adjust the processing system machines to eliminate a trend of authentic notes selected as being counterfeit?

Our processing systems and procedures, which are never discussed in public, remove counterfeit notes from circulation. Also there is a comprehensive sort and inspection of currency for defects (holes, tears, tape, etc.), fitness, and correct denomination. In 1993, the Federal Reserve System processed over 20 billion notes and 108 thousand counterfeit notes were detected.

In order to achieve a high success rate, many genuine notes must be rejected. For every one million notes processed by Reserve Banks, about one thousand are suspected by the counting machines to be counterfeit notes and thus inspected by an operator, and five are determined to be counterfeit. The results vary by denomination, with more genuine notes being rejected in the higher denominations and more counterfeits being found.

The genuine notes that are rejected share similar magnetic characteristics with counterfeit notes. Thus, the number of genuine notes rejected can be reduced at the expense of recirculating counterfeit notes among the public.

5) Please comment on the impact a change in the design of the currency will have on the Federal Reserve and the financial sector.

The overall benefits of a change in the design of the currency stem from the security that an improved design affords. This is true from the standpoint of the general public, the financial sector, and the Federal Reserve System. The public will, of course, benefit from the new design because there will be new visual authentication features added to the notes.

Since no recall, demonetization, or cancellation of the legal tender status of United States currency is planned, only moderate currency inventory increases are needed to begin co-circulation of the old and new designs. Thus, the changes to the Federal Reserve System will be moderate.

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STATEMENT OF PETER H. DALY
DIRECTOR OF THE BUREAU OF ENGRAVING AND PRINTING
BEFORE THE COMMITTEE ON BANKING, FINANCE AND URBAN AFFAIRS
U.S. HOUSE OF REPRESENTATIVES

Good morning Mr. Chairman and members of the Committee. Thank you for the opportunity to appear before you today to discuss the technical aspects of U.S. currency redesign. With me is the Bureau's Assistant Director for Research and Development Thomas A. Ferguson.

Research into advanced counterfeit deterrent features for U.S. currency has been underway at the Bureau of Engraving and Printing over the last decade. As you know, two new such features -- a denominated security thread, and microprinting around the portrait -- were added in the 1990 series currency primarily to defend against the high fidelity color copiers entering the world market. These features cannot be reproduced on those machines, and appear quite effective in deterring conventional counterfeiting as well. Most counterfeits continue to be of series notes before 1990.

Immediately after implementing the 1990 series, BEP began active research into next generation counterfeit deterrence. We contracted with the National Academy of Sciences for an updating of its original 1987 report on anti-counterfeiting technologies suitable for use on U.S. currency, and conducted a comprehensive industry survey for emerging or innovative ideas for enhancing the security of our currency from counterfeiting. These efforts resulted in an inventory of 14 features which could be used

immediately, and a number of others which have potential but require further development.

With the strong interest and support of Secretary Bentsen and Under Secretary Newman, as well as the public statements that you have made, Mr. Chairman, we began development of a new design for U.S. currency which could accommodate the production-ready features while providing sufficient elasticity of design so as to accommodate new features which might be required later to defend against even newer technologies.

As you know, the design of U.S. currency has been virtually the same for over 60 years, with only minor changes. However, the combination of rapidly advancing technology and continued strong world demand for the dollar makes most unlikely a similarly long period of constant design. Rather, we have entered an era of regular change so that we may always stay ahead of the curve and be as pre-emptive as possible in deterring new counterfeiting threats.

In creating this new design concept, we have endeavored to retain the traditional look of the dollar. Although the visual changes to this new series U.S. currency will be more dramatic than seen in many years, we believe it essential to keep as much as possible of the traditional design so as to minimize any confusion which may develop during the initial phases of the changeover. Accordingly, we have only made changes that allow for the inclusion of specific counterfeit deterrent features. Therefore, the size, portrait subjects, and national symbols used on the new series will be the same as those used on the current one. Furthermore, because the NAS determined in their 1987 and 1993 studies that color was an ineffective deterrent against today's high quality color copiers and computer scanners, the color of the new series will also remain the same. Also, the

same classical banknote style engraving technique will be used on the portraits, borders, and numbers. What will change, however, is the configuration of these elements on the note so as to allow for the inclusion of new deterrent features or to strengthen the ones already in use.

At this point the final costs of the enhancements cannot be defined, as contracts have not been made and prices are dependent on the final package of features and volumes. However, we estimate that these enhancements will add approximately 20-25% to the cost of currency or approximately 1 cent per note. This would represent an increase of between $7.5 million and $10 million for new $100 bills in the first year of production. The BEP operates on a revolving fund and the cost of currency, including these enhancements, is paid for directly by earnings of the Federal Reserve System. Therefore, no appropriations will be required to support this effort. Also, as Under Secretary Newman and Governor Kelley note, the value to the Treasury of wide acceptance of our currency exceeds these costs by many multiples.

The BEP and the Federal Reserve System are prepared for the introduction of this new currency. Adequate production capacity exists to meet both the current demands and the conversion to the new series.

Mr. Ferguson will detail the design elements, and explain the technical reasons for their value as deterrents against various methods of counterfeiting.

Thank you for your attention, Mr. Chairman. I will be pleased to answer any questions you or members of the committee may have.

COUNTERFEIT DETERRENT FEATURES

for the

NEXT-GENERATION CURRENCY DESIGN

Statement of

Glenn T. Sincerbox

Chairman of the Counterfeit Deterrent Features
for the Next-Generation Currency Design Committee
of the National Research Council

and

Program Manager, IBM Corporation

before the

Committee on Banking, Finance and Urban Affairs

U. S. House of Representatives

July 13, 1994

Thank you Mr. Chairman and members of the Committee.

My name is Glenn Sincerbox. I am a program manager at the IBM Almaden Research Center in San Jose, California.

I am pleased to have this opportunity to brief the House Committee on Banking, Finance and Urban Affairs on the results of a study I recently chaired for the National Research Council on counterfeit deterrent features for the next generation currency design. The Research Council is the operating arm of the National Academy of Sciences, the National Academy of Engineering and the Institute of Medicine, chartered by Congress in 1863 to advise the government on matters of science and technology. This study began in 1992 when the Department of Treasury's Bureau of Engraving and Printing requested that the National Research Council, through its National Materials Advisory Board, analyze and recommend overt counterfeit deterrent features that could be incorporated into a redesign of U. S. banknotes.

The major objectives of this study were to:

- analyze and recommend new overt counterfeit deterrence features that can be incorporated into U. S. currency in the short term, intermediate term, and long term; and

- assess technological directions of future reprographic techniques that could be used for counterfeiting by "casual" and "professional" counterfeiters.

A committee of 12 volunteers with expertise in advanced reprographic technology, chemistry, color, optical science and engineering, paper, physics, security marking and systems engineering was formed. The committee met six times between June 1992 and June 1993. Invited presentations by experts from industry and government provided data relevant to the production and inspection of banknotes, advanced reprographic technology,and advanced counterfeit deterrence features and methods.

For the sake of brevity, I will restrict my remarks today to the major findings and recommendations of the committee. Additional information regarding counterfeiting threats, feature description and assessment, deterrent strategies and advances in reprographic technology can be found in the report.

Traditional counterfeiting deterrents, such as unique high-quality paper, fine-line engravings and high-pressure (intaglio) printing, were adequate in the past to restrict counterfeiting to the dedicated craftsman with access to a printing press; these have kept counterfeiting to a reasonably manageable level in the United States. However, with the advent of advanced reprographic systems, such as color copiers and scanner/computer/printer

systems, these methods are no longer sufficient. Widespread availability of these systems, reproduction quality, ease of use and relative freedom from discovery combine to create an atmosphere for occasional, casual counterfeiting - a crime of opportunity. These systems also provide a convenient base technology for the more professional counterfeiters so that they need only concentrate on simulating the deterrent features and not on the engraving and printing processes. The counterfeiter's task is made easier by a public in the United States that, for a variety of reasons, does not appear to aggressively examine its banknotes and report counterfeit bills.

Placement of new non-impact color copier and printer systems in 1995 is expected to exceed 2 million units in the United States, and a similar number is expected for the rest of the world.

The amount of counterfeit notes produced using non-impact reprographic technology (i.e., copiers, scanners, and computer printers) is presently small in contrast to that produced by lithographic processes that use specialized equipment. The rate of growth, however, is geometrical. An illustration of how large the problem could become is to assume that the rate of counterfeiting with non-impact reprographic equipment doubles every year until year 2000, as it has since 1989. With this assumption, the present day value of counterfeit currency could grow to almost $2 billion in the year 2000. Obviously, such a large amount of counterfeiting would cause severe problems for the economy as well as impacting the ability of law enforcement agencies to respond. Fortunately, appropriate actions can be taken long before counterfeiting becomes a problem of such proportions.

Over the course of this study, technical information about numerous deterrent features was gathered from vendors, expert witnesses, the Bureau of Engraving and Printing, the Federal Reserve Board, and the Secret Service. This information ranged from conceptual proposals with little or no supporting data to prototypes with extensive test results. A limited amount of data were also available for features already in use on the currency of other countries.

The overall effectiveness of an individual feature was determined by two primary considerations: resistance against technical threat and technical success probability.

Resistance against technical threat assumes success in deploying the deterrent and is a measure of the feature's value as a counterfeit deterrent. This category is subdivided in the four subcategories: (1) visual and tactile recognizability, (2) inherent resistance to copying, (3) resistance to simulation, and (4) ease of machine readability.

Technical Success Probability is a measure of the risk of incorporating a feature into a banknote. This category is also subdivided into four subcategories to identify the primary areas of consideration. These are (1) availability and manufacturability, (2) change to recurring production costs, (3) durability, and (4) capital cost of new or modified production tooling.

The two categories with their eight subcategories form the cornerstone of the committee's evaluation by helping identify the relative strengths and weaknesses of each feature.

The committee did not expect that any single feature would rank first in all categories, and none did. Hence, the committee thought it was important to understand the intent (target) of each deterrent. In order to provide a multifaceted system of deterrents, consideration should be given to deploying multiple features that complement each other. A well-designed set would address issues of visibility and recognizability under different viewing conditions; require different methods and skills for simulation; and, generally, require too many additional process steps for anyone but the dedicated professional to attempt. Some caution is required, however. The use of too many features could overwhelm the public and thereby reduce the overall effectiveness of the deterrents.

Features that defeat the casual counterfeiter do not necessarily work effectively against professional counterfeiters. Casual, opportunistic counterfeiters do not have the skills, resources, or determination to defeat sophisticated individual deterrents or combinations of them, whereas professional counterfeiters do have these skills and the resources to simulate or duplicate any single deterrent, and probably most combinations, given sufficient time. Certain combinations of features, rather than features acting alone, offer robust potential for defeating the casual counterfeiter and slowing down the professional. In the committee's opinion, the set of deterrent features need not be the same on all denominations of banknotes. For example, more sophisticated features may be used on the $100 banknote than on a $5 (or $1) note.

Based on these and other findings the committee has made several recommendations.

Although there are many new features that can be used to deter counterfeiters, the Bureau of Engraving and Printing should continue to utilize fine-line engraving, intaglio printing on high-quality pale-tinted paper, and the security thread as methods of deterrence against "classical" printing technologies and present-day reprographics. Future banknote designs should also incorporate additional visible features to serve as deterrents against counterfeiting and as a means for rapid visual authentication. If analysis shows it is cost effective to do so, some of these overt features could be incorporated into a banknote and their existence not publicly disclosed until they are needed to thwart a new counterfeiting threat.

The BEP should implement a system of complementary features on each banknote that create added complexity for simulation by all levels of counterfeiters. They should not, however, constrain their design by a requirement that the same set of counterfeit deterrence features be on all denominations of bills.

The BEP should redesign U. S. banknotes to include at least some of these recommended features, making such changes in appearance as are necessary to produce a new series of notes that effectively and efficiently incorporates these advanced counterfeiting deterrents.

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The recommended features fall into three categories: near term, intermediate term, and long term.

In the near term, the committee recommends incorporation of at least some of the following visible features:

color-shifting inks for printing;

moire (alias-generating) line structures, with color added as necessary to enhance the effect;

security-thread modifications e.g., location or width based on the denomination;

variable-size dot patterns, with color added to enhance the effect; and

localized watermarks.

For the intermediate term, features requiring inexpensive visual aids for detection at the point of sale are recommended. These include:

infrared inks for printing;

optically active coated fibers and particles embedded in the substrate; and

photoluminescent inks for printing.

Longer-term plans for advanced deterrents should include additional development and understanding of the following features:

diffraction-based holograms and related devices;

embedded zero-order diffraction gratings;

laminated paper substrates with selected features;

metallic or specular woven security features;

optical fibers embedded in the substrate; and

random pattern encryption methods.

For the far term, the BEP should continually assess fundamental advances in the chemical, applied physical, and biological sciences for developments that are applicable to

innovative deterrent features. Assessment of research in psycho-physics would also be pertinent since a better understanding of how people perceive visible features may provide insight into the selection of the "best" features.

Before any new counterfeit-deterrent feature is implemented, it should be evaluated by adversary-analysis experts to determine how readily it can be defeated. This process would be aided by having a means to quickly produce currency with appropriate design changes.

There are other aspects of a counterfeit deterrent strategy that should be developed along with incorporating new features in banknotes. To begin with, counterfeit-detection education should be emphasized for point-of-sale persons as a priority, and it should be available for the public at large. Potential incentives that would encourage the public to turn in counterfeits should be closely studied to determine which would be effective and not subject to abuse.

Industry should be encouraged to develop effective point-of-sale aids to assist in banknote authentication. Efforts that will lead to a high degree of authentication, particularly for the higher denomination bills, should be continued.

The Department of Treasury should investigate the cost effectiveness of requiring source identification, such as machine serial numbers, to be embedded in images produced by new copier and printer systems that are capable of producing quality color counterfeit banknotes. If it is determined to be cost effective, appropriate U.S. legislation requiring source identification should be encouraged. In addition, the Department of Treasury should strongly encourage the use of sensors built into color copier and printer systems that can recognize and inhibit banknote copying. For this approach to be most effective, a unique feature with a high signal-to-noise ratio should be identified, developed, and applied universally to currency, possibly in conjunction with other nations.

To stay ahead of the evolving counterfeiting threats, the Department of Treasury (perhaps led by the BEP) should establish a multiphased program of identifying and evaluating advancements in relevant technologies. Understanding the technological progress in non-impact printing technologies, and which counterfeiting techniques and methods are being employed, would help the Department of Treasury anticipate advances in the sophistication level of counterfeiters so that the type and timing of counterfeit deterrents could be planned accordingly. Appropriate mechanisms to accomplish this can take the form of advisory panels, committees, workshops, and briefings.

The BEP should continue to reevaluate its current materials, process specifications, and tests against actual use requirements, taking into account that different use requirements may apply to different bill denominations. Correlation should be made between the different failure modes of currency experienced in practice and the suite of specification tests performed by the Bureau of Engraving and Printing.

Long-range systematic planning for incorporation of features should be instituted as a regular part of the mission within the Department of Treasury.

Finally, the Department of Treasury should continuously gather data from other nations as to the effectiveness and durability of features such as color-shifting inks and holograms that have been incorporated into their currency.

Mr. Chairman, members of the Committee, thank you for the opportunity to summarize our study. I have attempted to provide you with an overview of our major findings and recommendations and hope that you have found my presentation informative. I will be happy to assist you in whatever way I can should you require greater detail.

TESTIMONY BEFORE THE
HOUSE OF REPRESENTATIVES COMMITTEE ON
BANKING, FINANCES AND URBAN AFFAIRS

COUNTERFEITING OF U.S. CURRENCY IS AN INSIDIOUS ACT WHETHER DOMESTIC OR INTERNATIONAL, AND THE CURE MUST BE DRAMATIC AND IMMEDIATE, WITH CONSIDERATION OF RECALL OR DEMONETIZATION

ROBERT J. LEUVER
EXECUTIVE DIRECTOR
AMERICAN NUMISMATIC ASSOCIATION
818 NORTH CASCADE AVENUE
COLORADO SPRINGS, COLORADO 80903

719-632-2646; Fax 719-634-4085

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INTRODUCTION

In World War II Operation "Bernhard" conscripted Jews from Nazi concentration camps in WWII to counterfeit British currency. About $600 million in counterfeited British pound notes of various denominations were used by the Nazis to purchase arms in Eastern Europe and to undermine the economy of Great Britain. However, during the Revolutionary War, the British counterfeited the Continental currency, which earned our currency the epithet "not worth a continental." In recent months there have been operations counterfeiting United States currency allegedly in Columbia, Italy and Lebanon's Bekka Valley, the latter with the assistance of national governments. The purposes have been to support drug operations, purchase arms and to undermine the U.S. economy.

Mr. Chairman, the Honorable Henry Gonzalez, and other distinguished members of the House of Representatives Banking, Finance and Urban Affairs Committee, it is a pleasure to appear once again before this Committee and testify on currency and counterfeiting. I do appreciate the invitation to testify. I am the former Director of the Bureau of Engraving and Printing and currently the Executive Director of the American Numismatic Association, a Congressionally chartered organization to further the collecting of currency, coins and other forms of money. Mr. Chairman, I would ask that my written remarks be entered into the record, as I would like to abridge my written remarks during this testimony.

COUNTERFEITING IS AN INSIDIOUS ACT COMMITTED DOMESTICALLY AND AN ACT OF AGGRESSION IF COMMITTED BY A FOREIGN COUNTRY

Counterfeiting of currency is an insidious act. If the magnitude is great enough and if it is underwritten by a government, it is an act of aggression against the integrity of the United States.

Again, if the magnitude of counterfeiting is extensive and pervasive, it could well be the World Trade Center catastrophe of international U.S. relations. Counterfeiting of currency causes economic hardship to the country whose currency is counterfeited and the people who receive the counterfeits.

Frankly, as the former director of the BEP, I recognize that much has happened since my tenure as director and with the inter-agency Counterfeit Deterrent Committee, of which I was a member for six years. I hold the management and staff of the BEP in great esteem, as they have considerable experience in printing United States currency, postage stamps and other security documents. They have studied the counterfeiting problem of United States currency for years and developed many solutions. The recent study commissioned by the BEP from the National Research Council, entitled *Counterfeit Deterrent Features For the Next-Generation Currency Design*, is the most comprehensive guide to counterfeit deterrents. This study has been distributed extensively among government printers and within the extended security printing industry.

The fact that there has been no significant change to United States currency since 1929, should be attributed to the political considerations of the executive branch and to a former subcommittee of this Committee. The reason given was a reluctance on the part of the public for change.. There has been many senior executives in the Federal Reserve Board, the U.S. Secret Service and the BEP who have been frustrated for years that a dramatic change to currency has not taken place.

Officials of the Federal Reserve Board can better testify how the U.S. public would react to any change to United States currency. As I recall, the Federal Reserve Board commissioned a survey about 1985 or 1986 with a major, national survey-conducting company. The Treasurer of the U.S., officials of the Federal Reserve Board, the U.S. Secret Service, and the BEP, including myself, attended a session conducted in Baltimore, Maryland. As I recall the results of the Baltimore session and the survey in general, participants preferred that there be no change to currency. However, the participants indicated that if the integrity of our currency was threatened and the economy would be threatened, a change was warranted and should be implemented. One side-bar to the survey was an impression that I and others took away. Namely, the fact that participants were very familiar with foreign currency and the brightness, counterfeit deterrents incorporated into these various currencies, and the periodic changes made to these currencies. Many participants had traveled as tourists, or military or members of their families who have been stationed overseas.

It would be fool-hardy for me to pose today as more knowledgeable than the current BEP management or staff in the matter of counterfeit deterrents. However, I would like to comment on some of the more obvious facets of counterfeit deterrents and the implications of any efforts to replace the currency in circulation.

VULNERABILITY OF U.S. CURRENCY

A Slovenia central bank official, responsible for training bank personnel, confronted me in Helsinki five weeks ago at the Mint Directors Conference. He asked me, "What are the discernible features in U.S. currency that would reveal a counterfeit bill." I pulled out a representative U.S. bank note and explained many of the known counterfeit deterrent features. He said that he knew of these from brochures sent to him by the Treasury Department. "But these are so simple," he said. "There must be others that are harder to detect." There weren't any additional visual deterrents, I explained.

United States currency is extremely susceptible to any act of counterfeiting, whether it be by an amateur with a color photocopy machine, or a good printing shop, or by the professional with sophisticated equipment. United States currency is a currency designed in the 1920s for the graphic technology envisioned for the 1930s. This is most vividly portrayed by the "Tin Lizzy" on the back of the $10.00 bill. The changes to currency have been minor and mostly as design changes, except for the plastic strip with "USA" and the denomination on the strip and microprinting around the portrait, introduced in 1990. The field has been tipped in favor of the amateur and the professional counterfeiter, since the advances in the science of reprographics, or the technical ability to reproduce images for printing, such as color separation and exact duplication of images, and color copiers.

It is believed that international counterfeiting poses the greatest counterfeiting threat to U.S. currency. In the U.S., only nine or eleven pieces per million notes processed by the Federal Reserve Banks are believed to be counterfeit. That is approximately $1 million each year. Thus the domestic problem is not that serious from domestically produced counterfeit notes.

The United States currency is the most accepted international currency and, in some cases, the only international currency accepted in many countries. The U.S. dollar, with notable chronological exceptions, is extremely stable and an excellent hedge against inflation. Consequently, the U.S. dollar is horded by individuals in countries with moderate to high inflation. As a stable, international currency, the U.S. dollar is an excellent monetary device to purchase arms and drugs. The U.S. Secret Service does an excellent job of monitoring and prosecuting counterfeiters in the U.S. However, counterfeiting of U.S. currency outside the U.S. is almost impossible to monitor. If foreign counterfeits of U.S. currency are of a reasonably high degree, there is an excellent chance that these counterfeits will be passed, and ultimately some will find their way into the U.S. and be accepted by the Federal Reserve sorting and authentication equipment.

A DRAMATIC CHANGE TO U.S. CURRENCY IS REQUIRED TO COMBAT COUNTERFEITING

U.S. currency requires a dramatic overhaul if it is to fulfill the axiom of the U.S. Secret Service, that a "U.S. currency should incorporate those counterfeit deterrents which would make it practically impossible for the amateur to counterfeit and extremely difficult for the professional." Our currency can be duplicated with great ease by the amateur and in a very professional manner by the professional--so good, that on numerous occasions, it can pass the sorting and authentication machines of the Federal Reserve System. The National Research Council in December 1993, stated: "Redesign of the U.S. banknotes is required to accommodate additional counterfeit-deterrent features. The extent of the design changes will depend upon the additional features selected, and which current ones are removed."

There are two types of counterfeit deterrents, covert and visual. or the man-on-the-street.

Covert deterrents are machine readable. Such deterrents are used by the Federal Reserve System and the U.S. Secret Service. These deterrents quickly can be recognized by machine and culled out from genuine notes. As such, the Federal Reserve Banks can reject the acceptance of these notes and ensure that such notes do not re-enter circulation. The U.S. Secret Service can immediately takes steps to eradicate the source of the counterfeit bank notes. The Federal Reserve System would be able to provide the knowledge of some of these counterfeit deterrents for use by banks and the money changing industry.

Other than any covert counterfeit deterrents that *might* have been added in the 1990 series of currency, the covert deterrents have been generally described and utilized by the money changing and vending machine industry. Any such covert deterrents that might now be in the currency, or might be added in the future, should be kept secret. These covert features need not be too many as they are machine recognizable by the Federal Reserve Banks. The covert deterrents can be changed at will or as new features might be required.

Visual, or man-on-the street, counterfeit deterrents are essential for the public, both in the United States and outside our borders. These counterfeit deterrent features are generally easily recognizable and generally more plentiful. For instance, there are some 12 or 13 such features in current United States currency. These features catch the eye of the man-on-the-street and provide confidence in the currency. However, these features often are the easiest to replicate.

There are a few simple rules for adding visual or man-on-the-street counterfeit deterrents to currency:

1. The counterfeit deterrents should be effective and complex enough to thwart the amateur counterfeiter and they should make it extremely difficult for the professional to replicate.

2. The counterfeit deterrents must be durable, capable of withstanding wear.

3. The counterfeit deterrents should be inter-related in the sense, that if one is defeated, another deterrent becomes operative and signal the user that a note is counterfeit, or that the deterrents are wedded one to another. A deterrent should not be added for its own sake, such as color, optical variable devices or engravings.

4. The cost of counterfeit deterrents must be relative to the risk of counterfeiting and the affect on the U.S. economy.

5. The counterfeits deterrents introduced into any new issue of currency should be so arranged that there is room to provide additional deterrents as circumstances may warrant.

6. Counterfeit deterrents "wear out," or become less than effective, so that consequently, the design of U.S. currency should be re-thought every 25 or 30 years.

My concept for an anti-counterfeit note appeared on the "Nova" program, *Making a Dishonest Buck,* about three or four times in the past 15 months. That same note was used more recently in *USA Today,* daily newspapers and numismatic trade publications. It is a simple note. However, this note is not necessarily the answer to counterfeiting. This sample note simply displays what might be done to protect United States currency and the inter-relationship of deterrents.

IS A RECALL OF CURRENCY NECESSARY TO COMBAT COUNTERFEITING?

Twenty-five years ago on July 14, 1969, the Treasury Department determined that no bills larger than $100, would be printed. For the past few years, we have heard calls for the elimination of the $100 as these bills have such an impact in the drug trade. Even bills have been introduced in Congress. We also hear that if a major change to currency is made, then the currency we have been using for some 65 years should be recalled or demonetized.

No issue of United States currency has ever been recalled. Only the $10,000 gold certificate, series of 1900, has been demonetized, that is, declared valueless. The inventory of canceled certificates had been destroyed in a fire at the 12th Street and Pennsylvania Post Office in 1935, but some were thrown out the window to reduce the fire hazzard. Consequently, all of the notes were demonetized for fear that some would be offered for redemption a second time. It is also unlwful to own any of these notes.

If counterfeiting is as serious as we have been led to believe by accounts in the press and statements from members of Congress, then there are three viable means to change over the currency now in circulation: first, allow the old and new currency to co-exist; second recall all the old currency within a determined period of time; and third, declare all currency valueless after a defined period of time--demonetization.

1. Co-existence. New currency would be introduced in large quantities and allowed to exist

side-by-side with the old currency, which would to culled out and replaced when processed at Federal Reserve Banks. This is a slow process and a difficult one, again considering the volume of United States currency in foreign countries and the fact that many people hoard United States currency. Due to civil unrest and political considerations, many people might not wish to exchange their old currency relatively immediately, particularly the larger denominations of bank notes, ensuring that old notes will be around for many years, even 10 or 15 years.

2. Recall. Within a definitive period of time, anyone possessing the old United States currency would be required to turn in such currency for the new issue. This would require the BEP to print and stockpile enormous amounts of currency. The Federal Reserve System would have to develop a monstrous plan for distribution and exchange in the U.S. and abroad.

3. Demonetization. This is a radical procedure. The Federal Reserve Board would have to declare the old currency valueless after a defined period of time. In essence, the old currency would also be recalled. Anyone hoarding the old currency would have to consider means to exchange their currency or wait for a more auspicious time and hope that they can negotiate an exchange. I am certain that U.S. government officials with responsibilities for international relations, especially international monetary relations, would wince at the thought what this would do to international relations.

On the assumption that the alleged current wave of counterfeiting of United States. currency is more serious than we have been led to believe, then the executive and legislative branches of the government have to consider the possibility of a recall or demonetization.

As the former director of the BEP, I would seriously consider the possibility of a recall or demonetization. These means are certainly extreme, but severe measures must be considered, if our currency is at a such a great risk as has been portrayed in the press and to which the members of this Committee may be privy.

As the executive director of the American Numismatic Association, both a recall and demonetization send a chill through my body. There are numerous dealers and collectors who have made a business and hobby of selling and collecting United States currency. A recall and/or demonetization would cause a serious loss of income or value to their currency. These notes, in many cases rare notes, are historical items which should not be destroyed. Much of the United States currency sold by dealers and collected by hobbyists has both and face value and a numismatic or collector value, that is an added value to the face value. This numismatic or value can be derived from the quality of the currency notes, the rarity of the note or serial numbers, the number of notes issued with specific signatures, and so forth. Currency dealers and collectors have an enormous investment in the currency currently in circulation, as well as any currency already issued by the United States.

HOW THE BUREAU OF ENGRAVING MIGHT COPE WITH A RECALL OR DEMONETIZATION OF THE CURRENT NOTES.

Again, it will take a long time to fill the pipe line with new notes both for domestic and international banks. For example, the $100 bank notes constitute approximately but three percent (3 %) of the annual production of United States currency, or a production of 270 million banknotes annually. These bank notes might well be printed on one of the BEP's 24 plus intaglio presses in 39 weeks. Mr. Chairman, you are quoted in the Congressional Record of May 11, 1992, as stating that of the $272 billion in United States currency, which is outstanding, $150 billion is in $100 bank notes. Also, you stated that two-thirds of these $100 bank notes are overseas, or approximately $100 billion. To paraphrase the eminent Senator from Illinois, Everret Dirksen, "That is a lot of money even for the U.S. Congress."

In order to provide new notes and replacement notes for all of the outstanding $100 bank notes, it would take some five and one-half BEP Intaglio presses, 52 weeks of press time, working three shifts a day, seven days a week. A simple algebraic formula would provide how much press time would be required to replace other denominations. It is obvious that all of the notes could not be replaced at one time, as the mere replacement of $100 notes is so extensive.

Incidentally, the private sector does not have the press capacity to print a given denomination of U.S. notes. Even if they did, they might well forsake other long-term business to accomplish this, irrevocably losing business to non-USA security printers. Further, many of the commercial security printers have smaller presses than the Intaglio 8s and 10s that the Bureau possesses and their presses are designed for shorter runs.

If color is an option as a counterfeit deterrent, the BEP pressmen rank among the finest in the industry. BEP produces some of the most excellent, multi-colored postage stamps in great volumes. These web offset and gravure color presses that the BEP possesses could be used to set down multiple background colors. The BEP has some of the largest and fastest web-offset presses in the security printing industry.

Recall , demonetization, the introduction of color or simply the process of "filling the pipe line" would or should require the elimination of the $1 bank note. The situation provides a unique opportunity to accomplish long-term cost savings in the minting of coins and the printing of currency. As, I have said, I have great respect for the pressmen at the BEP and know they are concerned about the elimination of $ as it might affect their jobs, as did the introduction of high-speed sheet-fed presses in 1956. However, I feel since the large quantities of denominations that would be required especially by recall or demonetization would require large volumes of currency for quite a number of years. After the pipe-line is filled and the exchange of the new currency for the old, the amount of currency required in normal bank operations would be similar to what is required today, as user learned to accommodate themselves to the lack of $1.00 bank notes by using larger denominations. Thus, the Bureau would not require additional presses for a number of years, but the pressmen would retain their jobs.

Additionally, the Treasury Department should consider the elimination of intaglio on the reverse side of the lower denomination bank notes. State-of-the art intaglio printing presses have a 6,000 pound pressure at the nip point where paper enters the impression cylinder and back-up cylinder. When the front side intaglio is printed, the reverse side intaglio is virtually crushed. An offset printing would be much more cost effective and allow for both new counterfeit deterrent devices and some interesting historical and educational designs.

CONCLUSION

Mr. Chairman, it has been a pleasure to appear before you and the members of this distinguished Committee. I am available at any time for consultation and I would be happy to respond to any questions at this time.

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STATEMENT OF
MORRIS WEISSMAN
CHAIRMAN OF THE BOARD & CHIEF EXECUTIVE OFFICER
UNITED STATES BANKNOTE CORPORATION

BEFORE THE HOUSE BANKING COMMITTEE

JULY 13, 1994

Mr. Chairman and Members of the Committee:

I am pleased to appear before you today to discuss the private sector security printing industry and to provide an overview of anti-counterfeit deterrent features used by United States Banknote Corporation and our subsidiary companies, American Bank Note Company and American Bank Note Holographics, in the manufacture and printing of currency for countries worldwide. In addition, I appreciate the opportunity to contribute constructive thoughts on some of the important issues that our government faces with the development of the next generation of U.S. currency design.

During the course of my testimony I will respond to the specific questions that the committee asked in its invitation letter as well as provide our thoughts with regard to various counterfeit deterrent features that are available. I have also brought samples for the Members of the Committee to better illustrate some of these specific counterfeit deterrents.

I would like to introduce two individuals that are with me today. Next to me is Robert Christophersen, Executive Vice President for Manufacturing, and in the front row is our new President and Chief Operating Officer, Ron Glover, who has just recently joined our team.

At the outset, I believe it would be helpful to draw a clear distinction between the currency operations of United States Banknote Corporation and the Department of the Treasury's Bureau of Engraving and Printing. Both organizations have very similar technical capabilities -- from world class engravers and highly trained and skilled craftpersons to state-of-the-art intaglio presses. In fact, many of the engravers and intaglio presspersons presently employed by the Bureau of Engraving and Printing served their apprenticeships with our company.

The principal difference between our organizations is that the Bureau of Engraving and Printing is a government agency with the sole responsibility for printing Federal Reserve notes, while United States Banknote Corporation is a private sector company that prints currency for many countries around the world, and does so on a competitive basis. The work we undertake is unique in each case. For instance, in some cases we print an entire series of notes, while in others we may only print a specific denomination.

I would also like to note the fact that United States Banknote Corporation is not a stranger to the printing of U.S. currency. While the Bureau of Engraving and Printing has capably filled the

role as our nation's currency printer for the past 117 years, our experience and relationship in this regard, through our subsidiary American Bank Note Company, dates back to 1795. In our early days, and in the first days of the Republic, American Bank Note Company printed banknotes for many U.S. states and private banks. These banknotes were **THE** U.S. currency in circulation at that time. In addition, we were involved in printing U.S. currency in denominations of ones, tens, twenties, fifties, and hundreds both during and after the Civil War.

United States Banknote Corporation and American Bank Note Company have printed currency for over 100 nations throughout the world with orders originating from the Central Bank of China (as well as other countries in Asia) to sovereign states in the Caribbean, Africa, Latin America, and the newly independent states in Eastern Europe. These orders have individually ranged from a few million banknotes to over one and a half billion notes. Attached is a complete list of the countries for which our company has printed currency at one time or another since we started in the business. Also, American Bank Note Holographics, a world leader in secure holography, has worked to perfect secure holographic devices for incorporation in today's sophisticated currency and currency substitutes. In fact, our holograms are in use today in **all** Visa and MasterCard credit cards throughout the world.

I. Counterfeit Deterrent Features

The first rule of thumb in developing a secure banknote is the use of multiple anti-counterfeit features, usually a combination of

several overt and covert ones. This is much more effective than simply using only one or two features -- the more features, the more difficult to counterfeit. With the public's growing awareness of the counterfeit problems, the utilization of sophisticated overt features provides for quick, accurate, on-the-spot visual authentication. Such public awareness of security features is rapidly becoming increasingly important as an anti-counterfeiting technique.

The second rule of thumb in the banknote community is that we must strive to always stay one step ahead of those attempting to counterfeit currency. We in the industry realize that with enough time, money and expertise, virtually any single anti-counterfeit feature can be duplicated or at least simulated in a fashion that would be accepted by and passed by the average user of currency. It is this second rule that makes the combination of several sophisticated anti-counterfeit overt and covert features in a banknote even more important and virtually a necessity today.

With the ever increasing sophistication, resolution, and quality of color copier and computer technology available today, the need for a new generation of counterfeit deterrents is upon us. In our continuing effort to develop anti-counterfeit features, we have found that three-dimensional holographic counterfeit deterrents (holograms and holographic threads) present the greatest barrier to color copiers -- in fact, to duplicate their resolution would require a copier that produces a copy with over twenty five times the resolution of the finest copiers available today.

At United States Banknote Corporation, we utilize the latest in counterfeit deterrent technologies to develop secure banknotes. Each note is unique in design and, depending upon the country and note denomination, contains different combinations of advanced counterfeit deterrents. The deterrents regularly used by our company are included in four distinct elements of currency composition -- design, substrate (paper), inks, and printing technologies/techniques employed. I would like to spend just a moment discussing each of these elements.

Design -

Truly secure currency starts with the design process. It is at this point where design elements such as single or multi-color images are combined with anti-counterfeit features to create an overall note design that is extremely difficult to separate, scan or copy. Accurate front to back registration of the note design, also an important counterfeit deterrent feature, is initially established during the design process. Complex lines, swirls and patterns add to the difficulity a counterfeiter would face in attempting to duplicate a note.

Substrate (paper) -

The foundation of banknotes is the substrate (paper) on which it is printed. In addition to the inclusion of counterfeit deterrents, substrate durability is also a feature that we pay close attention to and whenever possible recommend a cylinder mould-made sheet -- the most durable currency paper available. Cylinder mould-made paper provides for the employment of truly

effective, visually apparent anti-counterfeit features, including: localized multi-dimensional cylinder mould-made watermarks that are sized to be visually apparent and recognizable -- preferably the same subject as that printed on the note, and windowed security thread that is wide enough to place a recognizable holographic three dimensional image with good color shift. Other available features, regardless of the type of paper utilized, are visible and invisible (fluorescent) multi-colored distinctive fibers incorporated in the sheet.

Inks -

The options for ink as a counterfeit deterrent are several. Multi-colored selectively inked and engraved intaglio images with one of the intaglio images being optically variable, and serial numbers printed with a penetrating ink to ensure that the paper fibers retain the ink and thus prevent it from being washed off are two options. Further examples of ink technology currently being developed for use on future currency include photochromatic inks that change color under ultraviolet light as well as the use of heat sensitive inks that change color with the warmth of a finger.

Printing technologies/techniques -

The use of deep engraving so as to supply high relief with the intaglio printing process gives the printed image on a banknote a "raised and raspy feeling". Included in this can be an engraved "Latent Image" which, when viewed at an angle, shows a hidden image or text. Offset security printing technologies include split fountain printing which provides a rainbow effect, and blocking

patterns that will drop out when attempted to be color copied or laser scanned. Holography is also a printing technology available today that produces a recognizable image which can move or change color or show depth when viewed at different angles.

As with most denominations printed by the private sector, Requests for Proposals (RFPs) or tenders are issued by the procuring countries and include very detailed specifications that provide little room for change or addition. Despite this, United States Banknote Corporation provides on-going counsel to our customers regarding the latest design and counterfeit deterrent technologies for banknotes that they may want to specify in their subsequent tenders. We have found that most are receptive to change in order to develop a more secure currency document.

II. Cost

Most banknotes printed by United States Banknote Corporation have a different cost per note - a cost that is determined largely by the security features incorporated in design, printing techniques and raw materials - particularly paper and ink.

In many cases there seems to be little rhyme or reason as to the criteria used by some of our international customers in determining the reasonable cost for a note. Despite this, our advice to our customers is that generally the cost of incorporation of a new security feature should not exceed the actual, perceived or expected cost of their counterfeiting problem.

III. Security of raw materials

The security printing industry, both public and private sector, is a business limited to only a small number of highly qualified organizations that guards its trade extremely closely. As with our industry counterparts, the United States Banknote Corporation utilizes state-of-the-art physical security systems, sophisticated personnel security clearance procedures, strict product accountability practices, and secure shipping methods. These combined efforts and activities ensure that every piece of paper is tracked, recorded and delivered to the customer in the exact quantity specified.

United States Banknote Corporation further requires that its suppliers of raw material use and enforce the same stringent physical security and accountability measures in their operations that we use in ours. Unannounced audits of on-site records and physical inventories of specific on-site raw materials are commonplace within the private sector industry.

Raw materials -- specifically currency paper and currency ink -- are the critical products used in the production of banknotes. It is important to stress that in our industry raw materials are **highly** specialized. For example, the Bureau of Engraving and Printing utilizes currency paper and currency inks that are manufactured to their specifications for their **sole** use. Whether sold to the Bureau of Engraving and Printing, United States Banknote Corporation, or any other security printer, the manufacturers of these raw materials are prohibited by contract from selling the exact same product to any other entity.

IV. Identification measures for the sight impaired

One of the challenges that those of us in the banknote industry constantly face is the development of a product that is user friendly to an ever-growing diverse population, including the sight impaired. Beyond language and education, the sight impaired face the greatest challenge in determining the denomination of one bill from another. The solutions to solving this dilemma are not easy, but we believe that some exist that could be implemented.

There are a number of ways to provide a means of denomination identification for the sight impaired. These include making each denomination a different size (as in Haiti, Malaysia and Great Britain) or utilizing pin sized holes or raised embossed printing to simulate braille. While potential solutions, each of these options raises technical complications and additional costs and none of them provides true authentication.

We believe that the most effective means of providing currency denomination identification and authentication for the sight impaired is through the use of deep intaglio printing which provides a "raised feel" that cannot be duplicated utilizing other printing techniques. By incorporating, for example, different printed shapes (i.e. squares, diamonds, circles, etc.) in a specific location of the bill, utilizing a specially designed intaglio printed pattern, the sight impaired can more easily identify and authenticate the note without having to add any cost to the note production.

V. Recommendations

A secure banknote incorporates multiple anti-counterfeit features. However, the most viable guard against counterfeiting are those elements that, by their very presence or absence, are immediately obvious and recognizable through casual observance by the average person. As a result, and from our experience, there are four anti-counterfeit features that we would recommend that would strongly enhance the security of U.S. currency. These are:

a. a multidimensional cylinder mould-made watermark;

b. a windowed holographic security thread;

c. a color shifting ink in an especially noticeable area; and,

d. an enlarged "Latent Image" incorporated in the guilloche workings (geometric lathe-work border) of the bill.

The watermark and thread would be incorporated in the substrate, while the color shifting ink and "Latent Image" would be contained in the printed portion of the note.

In our view, these options would add the greatest security to U.S. currency and could be implemented almost immediately. While these additions may generate reasonable incremental increases in material costs, they should not add any capital expense to the government for new advanced equipment. In addition, they would not require research and development costs as these technologies presently exist and are in use in other currencies throughout the world.

VI. Conclusion

I would like to commend the individuals with the Department of the Treasury, the Bureau of Engraving and Printing, the Secret Service, and the Federal Reserve for undertaking the task of re-designing our nation's currency. This process is never easy and, as the new features still have to be implemented, is far from over. The announcement made today is a good start, but as I stated earlier, we cannot afford to stop here -- we should begin now to start thinking about the currency design for the generation beyond this new currency. United States Banknote Corporation, American Bank Note Company and American Bank Note Holographics stand ready, and would welcome the opportunity, to lend our expertise to the government in any way we can -- both now and in the future -- to support the further consideration and development of counterfeit deterrent features for U.S. currency.

It has been our pleasure to speak with you today. I hope that our comments and thoughts have been helpful - I have endeavored to make them in as constructive a fashion as possible. I would be pleased to answer any questions you may have.

Attachment

Countries for which United States Banknote Corporation and its subsidiaries have printed currency

Afghanistan
Albania
Antigua
Argentina
Australia
Bahamas
Barbados
Belgian Congo
Bermuda
Bolivia
Brazil
British Guiana
British Honduras
Bulgaria
Cambodia
Canada
Ceylon
Chile
China
Colombia
Costa Rica
Cuba
Curacao
Cyprus
Czechoslovakia
Danish West Indies
Danzig
Dominica
Dominican Republic
Dutch East Indies
Dutch Guiana
Ecuador
Egypt
Estonia
Ethiopia
Figi
French West Africa
Germany
Gibraltar
Greece
Grenada
Guatemala
Haiti
Hawaii
Honduras
Hong Kong
Iceland
Indo-China
Iran
Iraq
Ireland
Israel
Italy
Jamaica
Kenya
Laos
Latvia
Lebanon
Libya
Lithuania
Luxembourg
Malaya
Malaysia
Maldive Islands
Malta
Martinique
Mauritius
Mexico
Montserrat
Morocco
Netherlands
Newfoundland
New Zealand
Nicaragua
Nigeria
Northern Rhodesia
Nyasaland
Panama
Papua
Paraguay
Persia
Peru
Poland
Portugal
Puerto Rico
Roumania
Russia
St. Kitts
St. Kitts Nevis
St. Lucia
St. Thomas
St. Vincent
Salvador
Sarawak
Scotland
Servia
South Africa
Southern Rhodesia
Spain
Straits Settlement
Surinam
Sweden
Switzerland
Syria
Tanganyika
Tobago
Trinidad
Tunisia
Turkey
Turks and Caicos Islands
Uganda
USA
Uruguay
Venezuela
Vietnam
Virgin Islands
Western Samoa
Yugoslavia

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(202) 225-4247

June 27, 1994

The Honorable Llyod Bentsen
Secretary of the Treasury
Department of the Treasury
15th and Pennsylvania Avenue, N.W.
Washington, D.C. 20220

Dear Secretary Bentsen:

On July 13, 1994 at 10:00 a.m., in room 2128 of the Rayburn House Office Building, the Committee on Banking, Finance and Urban Affairs will hold a hearing to examine the initiatives being adopted by the Department of the Treasury to deter counterfeiting of U.S. currency. It would be an honor for the Committee if you or a designee were to formally announce the changes in the design of the Federal Reserve note at the outset of the hearing. You or your designee are thus respectfully invited to testify on the new counterfeiting deterrent features and related matters.

Please select a representative of the Bureau of Engraving and Printing (BEP), U.S. Secret Service and the Treasurer of the United States to testify at the hearing on their involvement with the development, issuing and/or security of the redesigned currency.

Each representative will be given 10 minutes to summarize their written remarks. The Banking Committee's rules require that they provide 200 copies of their individual written testimony no later than 10:00 a.m., July 12, 1994, to room 2129 of the Rayburn House Office Building.

Thank you in advance for your time and consideration. The Committee looks forward to the announcement.

Sincerely,

Henry B. Gonzalez
Chairman

HBG:tn

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(202) 225-4247

June 23, 1994

The Honorable Edward W. Kelley, Jr.
Member of the Board
Board of Governors of the Federal
Reserve System
Constitution Avenue & 20th, N.W.
Washington, D.C. 20551

Dear Governor Kelley:

On July 13, 1994 at 10:00 a.m., in room 2128 of the Rayburn House Office Building, the Committee on Banking, Finance and Urban Affairs will hold a hearing to examine the initiatives being adopted by the Department of the Treasury to deter counterfeiting of U.S. currency. It is anticipated that the Department of the Treasury will formally announce changes in the design of the Federal Reserve note at the outset of the hearing. You are respectfully invited to testify on the initiatives and related matters at the hearing.

So that the Committee may better understand the various issues involving the change in the design of the Federal Reserve note, please provide responses to the following questions in your written statement.

1) According to figures provided to the Committee by the Federal Reserve and the U.S. Secret Service, the confiscation and detection of counterfeit notes represents less than .048% of the amount of currency in circulation. From a strictly statistical standpoint, it appears that the number of counterfeit notes is insignificant and a redesign of the currency is unnecessary. Do you believe this to be the case? Please explain.

2) What is the Federal Reserve's role in the detection of counterfeit notes and the issuing of the new currency?

3) The Federal Reserve estimates that for 1993, approximately 62% of the currency outstanding was held outside the United States. How are these estimates determined? Please estimate this figure for each of the past five years.

4) What percentage of notes suspected of being counterfeit by the Federal Reserve's currency processing systems, indeed turn out to be counterfeit? What similar characteristics do authentic notes that are selected by the systems as being counterfeit share? Are you able to adjust the processing system machines to eliminate a trend of authentic notes selected as being counterfeit?

5) Please comment on the impact a change in the design of the currency will have on the Federal Reserve and the financial sector.

Please feel at liberty to add any additional comments that you believe to be pertinent to our understanding of the matter. You will be given 10 minutes to summarize your written remarks. The Banking Committee's rules require that you provide 200 copies of your written testimony no later than 10:00 a.m., July 12, 1994, to room 2129 of the Rayburn House Office Building.

Thank you in advance for your time and consideration. The Committee looks forward to hearing your testimony.

Sincerely,

Henry B. Gonzalez
Chairman

HBG:tn

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(202) 225-4247

June 23, 1994

Mr. Glenn T. Sincerbox
Chairman
Committee on Next-Generation Currency Design
National Materials Advisory Board
Harris Building, Room 262
2102 Constitution Avenue, N.W.
Washington, D.C. 20418

Dear Mr. Sincerbox:

On July 13, 1994 at 10:00 a.m., in room 2128 of the Rayburn House Office Building, the Committee on Banking, Finance and Urban Affairs will hold a hearing to examine the initiatives being adopted by the Department of the Treasury to deter counterfeiting of U.S. currency. It is anticipated that the Department of the Treasury will formally announce changes in the design of the Federal Reserve note at the outset of the hearing. You are respectfully invited to testify on the initiatives and related matters at the hearing.

So that the Committee may better understand the various issues involving the change in the design of the Federal Reserve note, please discuss the findings and recommendations included in the report entitled *Counterfeit Deterrent Features for the Next-Generation Currency Design* in your written statement. In addition, please be prepared to answer questions on the announced changes in the design of Federal Reserve note.

Please feel at liberty to add any additional comments that you believe to be pertinent to our understanding of the matter. You will be given 10 minutes to summarize your written remarks. The Banking Committee's rules require that you provide 200 copies of your written testimony no later than 10:00 a.m., July 12, 1994, to room 2129 of the Rayburn House Office Building.

Thank you in advance for your time and consideration. The Committee looks forward to hearing your testimony.

With best wishes.

Sincerely,

Henry B. Gonzalez
Chairman

HBG:tn

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(202) 225-4247

June 23, 1994

Mr. Robert J. Leuver
Executive Director
American Numismatic Association
818 N. Cascade Avenue
Colorado Springs, Colorado 80903

Dear Mr. Leuver:

On July 13, 1994 at 10:00 a.m., in room 2128 of the Rayburn House Office Building, the Committee on Banking, Finance and Urban Affairs will hold a hearing to examine the initiatives being adopted by the Department of the Treasury to deter counterfeiting of U.S. currency. It is anticipated that the Department of the Treasury will formally announce changes in the design of the Federal Reserve note at the outset of the hearing. You are respectfully invited to testify on the initiatives and related matters at the hearing.

So that the Committee may better understand the various issues involving the change in the design of the Federal Reserve note, please provide responses to the following questions in your written statement.

1. In the past, the Department of the Treasury has taken the position of not issuing a recall of existing notes when introducing changes in the design of the currency. Can the existing currency be replaced on a schedule that can ensure continued public confidence in its value? In your opinion, what is the best way for the new notes to be placed in circulation?

2. The Department of the Treasury introduced security measures in the 1990 series notes. How effective do believe those features have been and how will the public perceive another change in the design of the currency?

In addition, please be prepared to answer questions on the announced changes in the design of Federal Reserve notes and their effectiveness in deterring counterfeiting.

Please feel at liberty to add any additional comments that you believe to be pertinent to our understanding of the matter. You will be given 10 minutes to summarize your written remarks. The Banking Committee's rules require that you provide 200 copies of your written testimony no later than 10:00 a.m., July 12, 1994, to room 2129 of the Rayburn House Office Building.

Thank you in advance for your time and consideration. The Committee looks forward to hearing your testimony.

Sincerely,

Henry B. Gonzalez
Chairman

HBG:tn

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(202) 225-4247

June 28, 1994

Mr. Ronald Glover
President & Chief Operating Officer
U.S. Banknote Corporation
51 W. 52nd Street
New York, New York 10019

Dear Mr. Glover:

On July 13, 1994 at 10:00 a.m., in room 2128 of the Rayburn House Office Building, the Committee on Banking, Finance and Urban Affairs will hold a hearing to examine the initiatives being adopted by the Department of the Treasury to deter counterfeiting of U.S. currency. It is anticipated that the Department of the Treasury will formally announce changes in the design of the Federal Reserve note at the outset of the hearing. You are respectfully invited to testify on the initiatives and related matters at the hearing.

So that the Committee may better understand the various issues involving the change in the design of the Federal Reserve note, please provide responses to the following questions in your written statement.

1. The U.S. Federal Reserve note has been regarded as being one of the easiest currencies in the world to counterfeit due to its relative simplicity. Being the printer of currency for numerous countries, please give an evaluation of each counterfeit-deterrent feature employed by U.S. Banknote. Please comment on the feasibility of implementing each measure into the U.S. currency.

2. What are the costs associated with the printing of the currencies? What is a reasonable cost of a counterfeit-deterrent feature and when does the cost not justify the measure?

3. What strategy does your firm adhere to when evaluating the different counterfeit-deterrent features? How do you weigh the variables?

4. A major obstacle for counterfeiters is the difficulty in obtaining the raw materials that go into producing the currency. Do private firms that produce foreign currency use the same materials contracted by the Bureau of Engraving and Printing? What precautions are taken to safeguard materials?

5. Do any of the countries you produce currency for have measures to identify the note to the blind. Has your firm researched the matter?

In addition, please be prepared to answer questions on the announced changes in the design of Federal Reserve notes and your company's experience with similar measures.

Please feel at liberty to add any further comments that you believe to be pertinent to our understanding of the matter. You will be given 10 minutes to summarize your written remarks. The Banking Committee's rules require that you provide 200 copies of your written testimony no later than 10:00 a.m., July 12, 1994, to room 2129 of the Rayburn House Office Building.

Thank you in advance for your time and consideration. The Committee looks forward to hearing your testimony.

Sincerely,

Henry B. Gonzalez
Chairman

HBG:tn

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July 5, 1994

HEARING NOTICE

To: Members of the Committee on Banking, Finance and Urban Affairs

From: Henry B. Gonzalez, Chairman

Re: Hearing on the Redesign of the U.S. Currency

On **Wednesday, July 13, 1994 at 10:00 a.m., in room 2128 of the Rayburn House Office Building**, the Committee on Banking, Finance and Urban Affairs will hold a hearing to examine the initiatives being adopted by the Department of the Treasury to deter the counterfeiting of U.S. currency. The Department of the Treasury will formally announce changes in the design of the Federal Reserve note at the outset of the hearing. The following is a tentative witness list:

Panel I
The Honorable Frank N. Newman, Under Secretary for Domestic Finance, Department of the Treasury
The Honorable Mary Ellen Withrow, Treasurer of the United States
Mr. Peter H. Daly, Director, Bureau of Engraving and Printing
Mr. Guy P. Caputo, Deputy Director, U.S. Secret Service
The Honorable Edward W. Kelley, Jr., Member, Board of Governors of the Federal Reserve System

Panel II
Mr. Glenn T. Sincerbox, Chairman, Committee on Next-Generation Currency Design, National Research Council
Mr. Robert J. Leuver, Executive Director, American Numismatic Association
Mr. Ronald Glover, President and Chief Operating Officer, U.S. Banknote Corporation

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July 11, 1994

HEARING NOTICE

To: Members of the Committee on Banking, Finance and Urban Affairs

From: Henry B. Gonzalez, Chairman

Re: Announcement of the Redesign of the U.S. Currency

On **Wednesday, July 13, 1994 at 10:00 a.m., in room 2128 of the Rayburn House Office Building**, the Department of the Treasury will formally announce changes in the design of the Federal Reserve note before the Committee on Banking, Finance and Urban Affairs. The following is the definitive witness list:

Panel I
The Honorable Frank N. Newman, Under Secretary for Domestic Finance, Department of the Treasury
The Honorable Mary Ellen Withrow, Treasurer of the United States
Mr. Peter H. Daly, Director, Bureau of Engraving and Printing
Mr. Guy P. Caputo, Deputy Director, U.S. Secret Service
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Panel II
Mr. Glenn T. Sincerbox, Chairman, Committee on Next-Generation Currency Design, National Research Council
Mr. Robert J. Leuver, Executive Director, American Numismatic Association
Mr. Morris Weissman, Chairman and Chief Executive Officer, U.S. Banknote Corporation

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February 21, 1992

The Honorable Nicholas F. Brady
Secretary of the Treasury
Department of the Treasury
1500 Pennsylvania Avenue, N.W.
Washington, D.C. 20220

Dear Secretary Brady:

I have read press accounts of a sophisticated counterfeiting scheme, with which I know you are familiar. I feel compelled to express my concern that the response of the Treasury has been inadequate. Much more aggressive efforts should be taken to increase the security of U. S. currency, than have been taken to date.

The Federal Reserve has made good progress in replacing old $100 bills in domestic circulation, but I am concerned that there is an inadequate effort to replace old bills in foreign circulation. In addition, there appears to be an inadequate effort to place necessary equipment to detect counterfeit bills offshore. Finally, a much more aggressive effort is needed to design and manufacture currency with high security features.

As you know, counterfeit $100 bills that appear to be from a foreign source have surfaced in this country in small numbers. These counterfeits employ an extraordinarily good print quality and the use of paper of the highest quality. Clearly, these counterfeits can pose a major problem, if the quantity increases. As you also know, detection of these counterfeits by ordinary means of visual inspection or examination of paper texture is practically impossible. This makes it clear that new security devices are required.

The new series $100 bill now being issued does include a security strip that is visible against light and thus defeats copier based forgeries. However, I believe additional measures are necessary. A security strip visible on the surface of bills is feasible, a good security measure, and one that is readily recognized. This type of measure would be far more useful than the

strip now being used. I also urge that you seriously consider utilizing inks with chemical "tags" that are easily detected and cannot be duplicated by forgers. To the extent that color changes, magnetic encoding and other steps can be taken, these should be considered as well. In addition, I believe United States currency should be redesigned in a systematic, aggressive manner, so that new anti-forgery devices are regularly issued. The very conservative steps taken with the new series $100 bill are inconsistent with the nature of the counterfeiting threat that exists today.

I would urge that you review the currency security program. The steps taken so far are better than none, but not in keeping with the techniques and equipment that are clearly being utilized by counterfeiters today. Your consideration and response will be sincerely appreciated.

Sincerely,

Henry B. Gonzalez
Chairman

copy to: The Honorable Alan Greenspan,
Chairman,
Federal Reserve Board

The Honorable Esteban Edward Torres,
Chairman,
Subcommittee on Consumer Affairs and Coinage

HBG:sst

THE SECRETARY OF THE TREASURY
WASHINGTON

February 28, 1992

RECEIVED
MAR 4 1992
Committee on Banking, Finance & Urban Affairs

The Honorable Henry B. Gonzalez
Chairman, Committee on Banking,
Finance, and Urban Affairs
U.S. House of Representatives
Washington, D.C. 20515

Dear Mr. Chairman:

Thank you for your letter of February 21, 1992 regarding counterfeiting of U.S. currency.

Please be assured that we too take this matter most seriously, and have undertaken an aggressive program of deterrence against such increasing counterfeiting threats. As you know, your staff was briefed by Treasury officials on this program last August, just prior to the issuance of the new, more secure $100 bills, and again recently by officials from the Federal Reserve.

The Treasury remains fully committed to protecting the integrity of our currency now and in the future. Please let me know if additional briefings for you or your staff would be helpful.

Sincerely,

Nicholas F. Brady

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FOR IMMEDIATE RELEASE
Julie Black
Press Spokesman
(202)-225-7141

WASHINGTON, D.C., June 27, 1994 -- House Banking Committee Chairman Henry B. Gonzalez will unveil the Department of the Treasury's new initiatives to deter counterfeiting of U.S. currency during a Committee hearing at **10 a.m. Wednesday, July 13, 1994 in 2128 Rayburn.**

"Because of the huge increase and sophistication in counterfeiting, normal means are no longer reliable to foil this class of counterfeiters," Chairman Gonzalez said. "Because of the seriousness of this situation, I have been urging Treasury for years to redesign our currency to make it less vulnerable to counterfeiting," Chairman Gonzalez said.

"Treasury has not always made counterfeiting a high priority. For example, in 1983, then Treasury Secretary Donald Regan proposed adding color to the U.S. bills as a way of deterring replication of the bills. His decision was later reversed by his successor at Treasury, James Baker. Thus I heartily applaud Treasury Secretary Lloyd Bentsen for elevating the importance of anti-counterfeiting measures," Chairman Gonzalez said.

Witnesses will include officials from the Department of the Treasury, Federal Reserve, U.S. Secret Service, Bureau of Engraving and Printing and the Treasurer of the United States as well as various academics.

Chairman Gonzalez said, "In the past, most counterfeiters relied on the public to accept a bill without properly examining it to verify its authenticity. The public was not always aware of the Treasury's previous counterfeiting deterrence features such as the security thread which runs through the bill (which could be seen by holding the bill up to the light) and the micro-printing that runs around the edges of the portrait on the bill. Treasury's new bill will help minimize such problems."

"Although the current data on confiscation and detection of counterfeit notes represents less than one percent of the amount of currency in circulation, we will be examining new deterrent features to discourage counterfeiters using color copiers and other means of reproducing currency," he said.

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LEACH-GONZALEZ INTRODUCE BILL TO FIGHT INTERNATIONAL COUNTERFEITING

FOR IMMEDIATE RELEASE
CONTACT: MIKE MCGARRY OR MARGO TANK
AT 202-225-2258

WASHINGTON, D.C., (October 28, 1993) -- In response to the increasing international threat to the U.S. economy and national security from international counterfeiters, U.S. Reps. James A. Leach (R-Iowa) and Henry B. Gonzalez (D-San Antonio, TX) yesterday introduced legislation to crack down on countries which sponsor international counterfeiting. The Congressmen introduced HR 3385, "The International Counterfeiting Deterrence Act of 1993" in response to information they received, some of which was highly classified, from U.S. officials who are close to anti-counterfeiting efforts. Rep. Leach is the Ranking Republican and Rep. Gonzalez is the Chairman of the House Banking Committee which has jurisdiction over U.S. currency and international capital flows.

"It has been reported publicly that billions of dollars of American currency around the world are fake and that as much as $200 million in counterfeit dollars have already been identified," Reps. Leach and Gonzalez said. "The unabated proliferation of counterfeit U.S. currency overseas threatens our economy, the integrity of our money supply, and the stability of our national security."

Chairman Gonzalez said, "U.S. currency is unfortunately too vulnerable to counterfeiting. I have seen clear evidence of a growing volume of counterfeit one hundred dollar bills of the best quality -- so good that it can only be detected by sophisticated tests. The threat isn't hypothetical -- it's real."

International counterfeiters are operating on an unprecedented scale and their activities have become a serious national security problem. Recent news reports indicate that terrorists in the Bekka Valley of Lebanon may be mass producing U.S. hundred dollar bills. Furthermore, there have been indications that counterfeit bills are being used to finance international terrorism and to purchase illicit weapons from international markets.

Reps. Leach and Gonzalez noted, "The issue is thus national security for ourselves and our allies such as Israel as well as the economic stability of our currency."

The Leach-Gonzalez bill would establish an Anti-Counterfeiting Strike Force, chaired by the Secretary of the Treasury. The Strike Force would be charged with coordinating U.S. policy for the prevention and detection of international counterfeiting. Specifically, the Strike Force would work to determine the extent and probable effect of counterfeit U.S. currency outside the United States and the extent to which it is engaged in as a form of economic terrorism.

In addition, the bill would authorize the Secretary of the Treasury to propose and enter into international agreements to promote international coordination in preventing, detecting, and prosecuting counterfeiters. It also calls on the Executive branch and the Federal Reserve Board to give high priority to currency redesign to ensure that the greatest protection against counterfeiting is provided.

The Leach-Gonzalez bill would also provide tough sanctions, one of which prohibits depository institutions in the U.S. from transferring funds or accepting deposits from any person of a foreign country which sponsors or participates in counterfeiting activities. Other provisions authorize severe criminal penalties against individuals who engage in counterfeiting overseas, and impose certain economic sanctions against countries engaged in state-supported counterfeiting.

"The bill is intended to increase coordination and accountability within the Executive branch and to require that counterfeiting become understood as a top national security concern. The bill also is intended to send a clear message to international counterfeiters that the U.S. is taking counterfeit deterrence seriously," said Reps. Leach and Gonzalez. "We plan to marshall all appropriate intelligence networks and law enforcement agencies to eradicate counterfeiting and preserve the integrity of our money supply."

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Questions of Chairman Henry B. Gonzalez
Redesign of the Currency Hearing
July 13, 1994

Mr. Peter H. Daly, Director, Bureau of Engraving and Printing (BEP)

In March of this year, the National Academy of Sciences hosted a conference, commissioned by the Bureau of Engraving and Printing, to study the problem of currency identification for the blind. It is anticipated that the results of the study will be available next December, which precedes the issuing of the redesigned Federal Reserve notes.

1. Will the results of the aforementioned study figure into the proposed changes in the design of the currency?

2. Has the BEP studied, and is it possible, to integrate a tactile security feature with the new changes, serving as both a measure to aid the blind and deter counterfeiting?

3. Are any additional studies or conferences scheduled on this issue in the near future?

Responses to Questions from Chairman Henry B. Gonzalez

1. Will the results of the aforementioned study figure into the proposed changes in the design of the currency?

The study of features for the visually impaired will be completed in December 1994. At that time, the BEP will evaluate the results to determine if any features offer significant and effective assistance to the visually impaired and warrant recommendation to the Secretary of the Treasury for inclusion in currency. If a feature is found to be effective and is approved for inclusion it is possible that it could be incorporated with the proposed changes for counterfeit deterrence dependent on the lead time for the feature selected.

2. Has the BEP studied, and is it possible, to intergrate a tactile security feature with the new changes, serving as both a measure to aid the blind and deter counterfeiting?

The BEP is not aware of any tactile feature that is effective for counterfeit deterrence and as a measure to aid the visually impaired. Tactile features that have been employed in other countries to assist the visually impaired have been found to be of very limited use. The BEP has asked the National Academy of Sciences to review all possible technologies and to recommend those that will be effective in this critical area.

3. Are any additional studies or conferences scheduled on this issue in the near future?

The National Academy of Sciences' panel will meet several times during the remainder of 1994 to complete their study and to finalize the report. The next meeting will be in August at the Smith-Kettlewell Eye Research Institute in San Francisco. There are not other studies or conferences on this issue scheduled.

Questions of Chairman Henry B. Gonzalez
Redesign of the Currency Hearing
July 13, 1994

Mr. Morris Weissman, Chairman and CEO of U.S. Banknote Corporation

As the printer of currencies for countries around the world, you have incorporated many, if not all, of the counterfeiting deterrence features that the Department of the Treasury announced at the hearing.

1. In your experience, how effective has each of the proposed changes to the Federal Reserve note been against the threat of counterfeiting.

2. What are the costs associated with each of the changes in the design of the currency planned by the Department of the Treasury?

3. Taking into consideration the factors of cost, the public's confidence in the currency, compatibility with current currency scanning equipment and counterfeiting deterrent effectiveness, did the Department of the Treasury select the most viable options?

United States Banknote Corporation

51 West 52nd Street
New York, New York 10019
(212) 582-9200
FAX (212) 582-9201

MORRIS WEISSMAN
CHAIRMAN OF THE BOARD
AND
CHIEF EXECUTIVE OFFICER

August 12, 1994

The Honorable Henry B. Gonzalez
Chairman
House Committee on Banking, Finance and Urban Affairs
2129 Rayburn House Office Building
Washington, DC 20515-6050

Dear Mr. Chairman:

Thank you for your invitation to testify at the recent hearing regarding the redesign of U.S. currency on July 13, 1994. It was my pleasure to provide you and the Members of your Committee information on the private sector security printing industry as well as the counterfeit deterrent features used by United States Banknote Corporation and our subsidiary companies, American Bank Note Company and American Bank Note Holographics, in the manufacture and printing of currency for countries worldwide.

Please find below my responses to the questions following the hearing that were forwarded to me by your committee.

Questions from the Honorable Henry B. Gonzalez

1. *In your experience, how effective has each of the proposed changes to the Federal Reserve note been against the threat of counterfeiting?*

   As stated in my testimony, one of the most important rules in the banknote industry when designing a more secure currency is to incorporate *several* counterfeit deterrent features -- thus compounding the technical complexity of the note. The new features announced by the Department of the Treasury will be more effective *in combination* with each other than individually. Their combination will result in a note that is much more difficult to counterfeit than U.S. currency now in use.

The most effective deterrent to the *circulation* of counterfeit currency will be the incorporation of those features that are easily recognized and verified by everyday users of currency. Our experience is that a well executed cylinder mould made portrait watermark and the intelligent and obvious use of a color shifting ink are two effective features for note authentication without the use of specialized knowledge or forensic analysis technology.

2. *What are the costs associated with each of the changes in the design of the currency planned by the Department of the Treasury?*

It is difficult for us to comment on the costs involved with each of the new counterfeit deterrent features. However, it is safe to assume that, pro-rated over the number of notes produced annually by the Bureau of Engraving and Printing, the average cost per feature will be between one and two tenths of a cent per note.

- The cost of the larger intaglio portrait as well as the Moire pattern will be minimal, only entailing initial costs associated with the completion of new designs and newly engraved printing plates.

- Incremental paper costs are dependent on the ultimate sophistication and material used in the "enhanced thread" as well as the type of watermark employed.

- Color shifting ink is more expensive than regular intaglio ink. Actual usage of color shifting ink will depend on the size of the intaglio image to be printed, the Bureau of Engraving and Printing's ability to "split fountain" to reduce ink consumption, and the effectiveness of the ink retrieval system on the Bureau of Engraving and Printing's presses.

3. *Taking into consideration the factors of cost, the public's confidence in the currency, compatibility with current currency scanning equipment and counterfeiting deterrent effectiveness, did the Department of the Treasury select the most viable options?*

Some of the counterfeit deterrent features selected, namely a well executed portrait watermark and the color shifting ink, will be effective counterfeit deterrents. However, the everyday user of currency will not have the sophistication to readily verify the other features. More overt security features, such as a windowed holographic security thread, would provide an easily identifiable verification feature that compounds the complexity of the paper substrate used. Counterfeit deterrents which are incorporated in the paper substrate are much more difficult to counterfeit than those printed on the note.

Questions of the Honorable James A. Leach
Redesign of the Currency Hearing
July 13, 1994

Mr. Peter H. Daly, Director, Bureau of Engraving and Printing

The Committee is aware that recent technological advancements have resulted in the manufacture of a high-speed, compact and relatively low-cost currency scanning machine which is now in use in thousands of bank branches throughout the U.S.

1. To what extent can increased use of these machines assist in preventing the introduction of counterfeit currency into the banking system?

During the past decade, several countries have redesigned their currency in order to improve counterfeit deterrence. These design efforts have been completed with varying success. One factor in the successful introduction of redesigned currency appears to be early collaboration between government printing agencies and affected industries such as the banking, vending and currency scanning industries.

1. How and when does the Bureau anticipate informing affected industries of the specific currency redesign efforts currently underway?

Responses to Questions from the Honorable James A. Leach

1. To what extent can increased use of these machines assist in preventing the introduction of counterfeit currency into the banking system?

The effect of currency scanning equipment on deterring counterfeiting can best be determined by the United States Secret Service as they have better knowledge of the means and methods of passing counterfeit notes. We at the BEP, do however, believe that the use of currency accepting equipment for vending and banking as well as currency scanning equipment to process money at banks and retailers will continue to grow. It is our opinion that the new currency needs to be machine friendly in order to facilitate its use with these machines. Therefore, the new currency design will include several new machine detectable features to aid in automated authentication and denomination of the notes.

2. How and when does the Bureau anticipate informing affected industries of the specific currency redesign efforts currently underway?

The manufacturers of currency handling and accepting equipment will be provided with notification of the changes prior to the introduction of notes into circulation. As with the Series 1990 notes, the manufacturers will be invited to the BEP where they will be provided with new currency to test and evaluate on their equipment. This process will be repeated for each denomination starting with the new $100 notes.

Questions of the Honorable Toby Roth
Redesign of the Currency Hearing
July 13, 1994

Mr. Guy P. Caputo, Deputy Director, U.S. Secret Service

I have a copy of a letter addressed to Secretary Bentsen from an organization called SICPA, which produces optically variable ink. Optically variable ink, or OVI, is an ink that will change color when you hold a dollar in different positions. SICPA states that it can produce this ink for less than a half cent cost per note.

1. I would like your opinion as to the value of OVI as an overt method of counterfeit deterrence, and if you feel that it would be cost effective to include in our currency.

Questions of the Honorable Toby Roth
Redesign of the Currency Hearing
July 13, 1994

Mr. Guy P. Caputo, Deputy Director, U.S. Secret Service

1. It has been suggested that a very deceptive counterfeit $100 bill has been circulating in Europe, the Middle East (and the U.S.A.) for several years. Is this true?

2. Since we have to believe that the counterfeit detection systems in Europe and in Middle Eastern countries are less effective than in the U.S. - Isn't it possible that we really have little actual knowledge of how widespread this counterfeiting problem is?

August 2, 1994

To: Mr. Tristan North
U.S. House of Representatives
Committee on Banking, Finance, and Urban Affairs

Fm: John Tomlinson JFT
U. S. Secret Service
Congressional Affairs

Re: July 13, 1994, Transcript Review and Question Responses

As per the directive dated July 18, 1994, I am returning the testimony of Deputy Director Guy P. Caputo which has been reviewed. All revisions are included in the written testimony, which is attached hereto.

I am also forwarding the Secret Service response to a total of three questions, each of which was submitted by the Honorable Toby Roth. For your reference, the response to each has been cleared through the Department of the Treasury.

We do appreciate your efforts in our behalf and your continued willingness to be of assistance. If I may clarify any of the information which was submitted, please contact me at

Attachments

Responses to questions submitted by the Honorable Toby Roth, emanating from the Redesign of the Currency Hearing on July 13, 1994.

Page 1, Question 1: I would like your opinion as to the value of OVI as an overt method of counterfeit deterrence, and if you feel that it would be cost effective to include in our currency?

Answer: The Secret Service has supported and will continue to support any security enhancement incorporated into the redesign of United States currency. The security enhancements providing the most intrinsic investigative value, would be those overt security features which are easily recognizable to the general public, a category into which the optically variable ink falls.
The more rapidly counterfeit currency is identified and the Secret Service is allowed to respond, the greater the probability of the successful suppression of the counterfeiting operation. Thus, the greater the investigative value of the overt security enhancements.

The portion of the question addressing the cost effectiveness of the inclusion of optically variable ink into our currency is not within the purview of the Secret Service and would be more appropriately addressed by the Bureau of Engraving and Printing.

Page 2, Question 1: It has been suggested that a very deceptive counterfeit $100 bill has been circulating in Europe, the Middle East (and the U.S.A.) for several years. Is this true?

Answer: There are many very deceptive counterfeit $100 Federal Reserve Notes currently in circulation worldwide. The increasing number of very deceptive counterfeit Federal Reserve Notes is being spurred by the technological advancements in the field of reprographics, namely advanced resolution.

I believe the specific counterfeit Federal Reserve Note, to which you refer, was first identified in December of 1989 in the Republic of the Phillipines. This particular counterfeit is currently the target of an ongoing investigation and to provide information regarding the investigation would require the revelation of sensitive and classified information. Therefore, any discussion of this investigation should be addressed in a private briefing which the Secret Service would be happy to provide to you.

Page 2, Question 2: Since we have to believe that the counterfeit detection systems in Europe and in Middle Eastern countries are less effective than in the U.S. - Isn't it possible that we really have little actual knowledge of how widespread this counterfeiting problem is?

Answer: The information which the Secret Service presents regarding the status of the counterfeit U.S. currency activity abroad is based on the "best available information". A combination of investigative, intelligence, forensic and statistical information is compiled and reviewed in an attempt to obtain the most accurate indication possible of that counterfeiting activity. The Secret Service believes that its estimates of counterfeit currency activity abroad are accurate. However, it is not possible to provide or predict with 100 percent accuracy, the extent of that activity.

The Secret Service is constantly striving to improve its techniques. We are currently developing, in conjunction with the Federal Reserve System, a program designed to obtain a more accurate estimate of the volume of counterfeit U.S. currency circulating abroad. The planned strategy would utilize the cooperative efforts of the United States and foreign Central Banks, commercial banks, and law enforcement authorities to secure accurate counterfeit U.S. currency activity reporting by various means, including opening additional lines of communication.

Questions of the Honorable Toby Roth
Redesign of the Currency Hearing
July 13, 1994

The Honorable Edward W. Kelley, Jr., Member, Board of Governors of the Federal Reserve System

1. Is it true that counterfeit currency, particularly $100 bills, has been received at the Federal Reserve Bank and recycled into circulation through member banks?

2. Could this have happened in large numbers during the past 5 years with deceptive counterfeit bills, perhaps originating in foreign countries?

BOARD OF GOVERNORS
OF THE
FEDERAL RESERVE SYSTEM
WASHINGTON

EDWARD W. KELLEY, JR.
MEMBER OF THE BOARD

August 1, 1994

The Honorable Toby Roth
House of Representatives
Washington, D.C. 20515

Dear Congressman:

I am pleased to enclose my response to your written questions following the July 13 hearing on redesigning U.S. currency.

I hope this information is helpful.

Sincerely,

Enclosure

cc: Mr. Tristan M. North
Committee on Banking, Finance
and Urban Affairs

Response to the Questions of the Honorable Toby Roth
Redesign of the Currency Hearing
July 13, 1994

Q.1. Is it true that counterfeit currency, particularly $100 bills, has been received at the Federal Reserve Bank and recycled into circulation through member banks?

Q.2. Could this have happened in large numbers during the past 5 years with deceptive counterfeit bills, perhaps originating in foreign countries?

A. The Federal Reserve System uses high-speed currency counting machines with special counterfeit detection sensors for the verification of all the currency it receives from depository institutions. The System is continually making improvements to these sensors, and we are confident that they perform with a very high degree of accuracy.

For $100s, no counterfeits have been paid out since August 1991, because since that date we have withdrawn all pre-series-1990 $100s from circulation. For a short period before August 1991, we may have paid out a very few high quality $100 counterfeits.

For other denominations, we are confident that we find virtually all counterfeits. We do track the number of counterfeit notes reported by depository institutions that are contained in our payments to them; that runs about 30 - 40 notes per year out of 21 billion notes paid out annually.

Questions of the Honorable Toby Roth
Redesign of the Currency Hearing
July 13, 1994

Mr. Morris Weissman, Chairman and CEO, U.S. Banknote Corporation

1. I would like to hear your opinion on the use of optical variable ink, or OVI. Do you feel that it is a valid means of overt deterrence to counterfeiters?

2. How would you compare OVI to the anti-counterfeiting devices currently in place on the U.S. currency?

Questions from the Honorable Toby Roth

1. *I would like to hear your opinion on the use of optical variable ink, or OVI. Do you feel that it is a valid means of overt deterrence to counterfeiters?*

   The validity of color shifting inks as counterfeit deterrents depends entirely on the size of the image printed. While this ink is very advanced technologically, the size of the image is important. A dime- or nickel-sized image that is printed using color shifting ink will be much more effective than one that is the size of a pencil eraser.

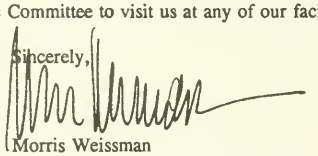
   The size of the color shift image cannot be too small. A knowledgeable counterfeiter could successfully pass a counterfeit note by simulating the most prominent color of the color shifting ink and adding iridescence to the ink to give the appearance of a color shift. Color shifting inks have a unique signature color which is almost impossible to replicate or duplicate. The sheen and shifting color cannot be reproduced by color copying machines. Color copiers reproduce only the most apparent color displayed by color shifting inks, i.e. green copies green. This too could present a problem if the color shifting image is too small and the public is unable to see the color shift. If the image is of sufficient size, color shifting ink can be very effective.

2. *How would you compare OVI to the anti-counterfeiting devices currently in place on the U.S. currency?*

   As compared to presently used anti-counterfeiting devices, color shifting inks will add a measurable degree of security as long as it is recognizable. Color shifting ink is available today and can be used without additional printing equipment. However, color shifting inks do not represent the entire answer to the development of a more secure currency. Multiple security features, preferably including a cylinder mould made portrait watermark and a three-dimensional holographic image on a windowed thread, together with other overt and covert features incorporated in a note, are the only way to properly address true counterfeit deterrence.

I trust that the above information provides sufficient technical detail in our response to the questions presented. On behalf of United States Banknote Corporation, I have appreciated the opportunity to contribute our thoughts on this most important issue and I would welcome the opportunity to work with you and your committee in the future. Please accept my personal invitation for you and the Members of the Committee to visit us at any of our facilities.

Sincerely,



Morris Weissman
Chairman and Chief Executive Officer

SECTION-BY-SECTION SUMMARY
H.R. 3385
"THE INTERNATIONAL COUNTERFEITING DETERRENCE ACT OF 1993"

A bill to protect the integrity of the Nation's financial system from international counterfeiting and economic terrorism, and for other purposes.

SECTION 1. SHORT TITLE

The International Counterfeiting Deterrence Act of 1993.

SECTION 2. INTERNATIONAL COUNTERFEITING DETERRENCE STRIKE FORCE

Establishes an International Counterfeiting Deterrence Strike Force (Strike Force) to be chaired by the Secretary of the Treasury (Secretary) with representatives from: Treasury, BEP, FED, Secret Service, FBI, CIA, State Department, Attorney General's Office.

Requires the Strike Force to determine the extent and probable effect of the counterfeiting of U.S. currency outside the U.S., and the extent to which it is engaged in as a form of economic terrorism and report to Congress annually.

Authorizes the Secretary to propose international agreements to achieve international coordination and cooperation in combating counterfeiting.

Authorizes the Strike Force to seek assistance from the intelligence community and the Secretary of Defense in carrying out its functions.

SECTION 3. STUDIES OF COUNTERFEIT DETERRENCE AND ENHANCED DETECTION AND ENFORCEMENT TECHNIQUES

Requires the Strike Force to do the following: 1) study available technological devices and methods used to enhance detection and enforcement techniques; 2) determine how much counterfeit currency has been detected and its cost to the U.S. government; 3) analyze and recommend methods and technologies used in the production of Federal Reserve notes; 4) study the demand for U.S. currency, to what extent its use is limited to $100 Federal Reserve notes and whether or not $100 Federal Reserve notes should be abolished.

Requires a report to Congress 18 months after the date of enactment. Allows certain information to be withheld if its disclosure would interfere with enforcement activities.

SECTION 4. CHANGES IN DESIGN OF CURRENCY

Establishes a Currency Design Commission composed of the Secretary, the Board of Governors of the Federal Reserve System, and the Director of the Bureau of Engraving and Printing. If any member of the Commission proposes a need for a design change for counterfeit deterrence purposes, and two of the three members agree, the Secretary is authorized to implement the design change.

SECTION 5. FOREIGN OFFICES AUTHORIZED

Authorizes the Strike Force to establish foreign offices to better coordinate U.S. overseas policy toward international counterfeiters.

SECTION 6. ANTICOUNTERFEITING TRAINING TEAM

Requires the Director of the Secret Service to establish a team of experts to provide training to foreign governments in detecting and prosecuting counterfeiting.

SECTION 7. NEGOTIATIONS WITH COUNTRIES IN WHICH A SIGNIFICANT AMOUNT OF COUNTERFEITING OF U.S. CURRENCY OCCURS

Authorizes the Secretary to negotiate and to enter into international agreements with foreign countries identified as engaging in significant amounts of counterfeiting, to share information, technical expertise, and ensure cooperation between law enforcement officers in the prosecuting of counterfeiting activities.

Requires an interim report to Congress and a final report on the outcome of the negotiations and on foreign countries where there is reason to believe that significant counterfeiting is occurring and for which no agreement was reached.

Authorizes the President to issue Executive Orders prohibiting Federal Reserve banks, depository institutions and other persons engaged within the U.S. in the transfer of funds from participating in any transfer of funds or accepting deposits from any person of a foreign country identified as engaging in significant amounts of counterfeiting. Also by Executive Order, foreign countries identified as engaging in significant amounts of counterfeiting, would also be prohibited from participating in any transfer of funds or from maintaining a deposit account in the U.S.

Authorizes criminal penalties, fines and/or imprisonment for not more than 15 years, for violations of any Executive order.

SECTION 8. AWARDS AUTHORIZED FOR COUNTERFEITING CASES

Authorizes the Strike Force to grant awards for actions that lead to convictions of person for violations of U S anti-counterfeiting laws.

SECTION 9. COUNTERFEITING UNITED STATES CURRENCY ABROAD

Allows those outside the U S., who engage in counterfeiting of U S. currency, to be fined and/or imprisoned for not more than 15 years.

SECTION 10. SANCTIONS AGAINST STATE-SUPPORTED COUNTERFEITING

Requires the Strike Force to recommend sanctions against any foreign country engaging in counterfeiting or who knowingly or recklessly permits counterfeiting to occur.

Requires the Export-Import Bank not to guarantee, insure, extend credit or service to any country engaging in counterfeiting or who knowingly or recklessly permits counterfeiting to occur.

Amends the Export Administration Act to include licensing for countries involved in State-supported counterfeiting.

Amends the Foreign Assistance Act of 1961 to prohibit foreign assistance to countries involved in State-supported counterfeiting.

FLOOR STATEMENT OF HENRY B. GONZALEZ, CHAIRMAN
COMMITTEE ON BANKING, FINANCE AND URBAN AFFAIRS
May 11, 1992

THE COUNTERFEIT THREAT

As long as money has existed, so has the problem of counterfeit. After all, if a paper coupon can be used as a medium of exchange, it has real value-- you can get something for it. And if you can produce a piece of paper yourself and get somebody to give you something valuable for it, you've managed to get something for nothing. The essence of crime is to get something for nothing, or for very little effort, and since counterfeiting is just that kind of thing, it is a very attractive kind of crime. So it should not surprise us that as long as paper money has been widely used, so has the crime of counterfeiting-- the crime of creating and using phony money.

Governments spend a great deal of time thinking of ways to prevent counterfeiters from debasing the currency-- since, if they have very much success, counterfeiters can literally destroy a large part of any country's monetary base. There are many twists and turns in this peculiar war of printers and engravers and paper-makers against one another, and every year this paper war becomes more complex-- never more so than it is today.

Unfortunately for us, United States paper currency is relatively unsophisticated, relatively easy to counterfeit, and is therefore perhaps the most attractive target in the world to

counterfeiters, who are today capable of producing bills of such accuracy that detecting counterfeits is virtually impossible except through the use of sophisticated equipment.

Our government could do a great deal more than it is to defeat counterfeit operators-- but it isn't. Because of this odd and irresponsible passivity, our currency is terribly vulnerable to counterfeiters who are enjoying a growing success in their efforts to get a great many millions for nothing.

The first line of defense in a safe paper currency lies in the paper used. Note paper has to have several qualities-- it has to be durable, for one thing. Paper money that falls apart after being soaked in water, for instance, is a worthless nuisance. The paper can't wrinkle very much, or get brittle after repeated handling. It has to hold ink, must be capable of resisting a great deal of handling without losing its texture, and it must be a texture that has a certain feel, a feel that people instantly recognize as being authentic. In many ways the biggest problem of the counterfeiter is to get paper that looks and feels right. For this reason, the manufacture and supply of paper for money is carefully guarded.

One way to get paper is very simple, and that is to take one dollar bills and literally launder them, bleaching out the ink. Once that's done, it is possible to produce a pretty decent $100 bill. But the best way to get good paper is to get the real thing, or find a supply that can pass for the real thing.

United States paper currency carries a distinct look-- it has tiny red and blue fibers scattered around. There are very few who

are capable of reproducing this kind of paper, which has an instantly recognizable look as well as feel. But it is not impossible to obtain paper that looks and feels right, and today, counterfeiters apparently have little trouble in getting paper that looks and feels like the real thing. Therefore the first line of defense, the paper itself, is no longer reliable in and of itself. Today, in fact, counterfeit $100 bills are in circulation that feel right, have the red and blue fibers, and look perfect. This counterfeit paper is so good that only chemical or flourescent light tests can detect it.

If paper security is breached, the second line of defense is in the printing process itself. Our government uses what is called the intaglio process, which uses extremely high pressure presses that literally force ink into the paper. A normal printing process simply puts ink on the surface of paper, but intaglio forces the ink actually in the paper itself. This is a process that requires presses of considerable size and great power. Presses of this kind are beyond the reach of just about anyone except governments. But of course these presses are available to many governments, not just ours. And it is therefore possible that counterfeits can be made on intaglio presses. In fact, there are currently counterfeit $100 bills in circulation that are clearly printed with the intag;io process-- therefore these counterfeits have the distinct, raised lettering feel of authentic bills. In other words, the two first lines of defense against phony bills have been penetrated-- the paper and printing.

The third defense against phony bills lies in the engraving or design. Governments take great care to design a bill that is very hard to duplicate-- tiny details are used that involve great skill and artistry. This is not art for the sake of art. Instead it is art that is hard to duplicate. The process includes micro-engraving, and if the tiny dots and swirls are not executed exactly right, the counterfeit is easily recognized. A missing line, a misplaced few dots, will foil a very good counterfeit. But unfortunately counterfeiters no longer have to rely on the eye and hand of a skilled engraver-- there is the photocopier. A photocopier makes exact copies, and these copies can be transferred into printed product. Today's counterfeiter is not a lone operator with a press and a set of engraving tools, but a crook with a very good photocopier and excellent press. There are some designs that will distort when copied, but sadly for us, these features are not well incorporated into our currency. Therefore as far as U. S. currency is concerned, there is very little protection in the design feature itself. Thus a third defense against counterfeiters is very weak indeed, as far as our currency goes.

Another defense is in the inks used. It is possible to use an ink that changes color when held against light, a kind of holographic effect-- but our government does not do this. It is possible to use inks with a certain electronic or chemical signature, a kind of tag. If this is done, it is possible to process bills for authenticity, even if the printing and engraving of the phony bill is perfect. I am glad to say that inks of this

kind are used, but it is by no means certain that counterfeiters won't find a way around this security feature. In any event, the false bills now in circulation look, feel, and and have the color of perfectly authentic currency. These counterfeits can be detected only by mechanical means.

This is why large denomination U. S. bills are being replaced as fast as possible, with a new series that incorporates a relatvely new safety feature-- the security strip.

The security strip has just one purpose, and that is to defeat photocopying types of counterfeits. In the new series of $100 bill, there is a strip imbedded that is visible when held agsinst a light. If you see this strip, you've got a good bill. It is the fact that light makes the strip visible, that makes it a guard against photocopying-- any time the copier makes a pass, the strip shows up and spoils the design. Even though this is a very good thing, the security strip is a very tenuous line of defense. We can and should do a great deal more to protect our currency, but the Treasury is continuing the most unimaginative, least aggressive, and most dangerous course possible. If there is a design change, the Treasury wants it to be all but invisible-- and so aggressive-- in other words, effective-- redesign is not considered by the Treasury. If new types of security inks are talked about, the Treasury refuses-- and so the least effective new ink features are used. If new paper types are suggested, the Treasury says that somebody else owns the patents, and so we use papers that incorporate not the newest security features, but

features-- like the security strip-- that other governments have used for years, and which therefore have the least promise of being effectve for very long. We can do more to protect our currency, amd we should, as I will demonstrate.

At the present time, the total amount of currency in circulation is about $272 billion. About half of this is in the form of $100 bills, some $150 billion worth. Of the $100 bills, about $100 billion circulate overseas.

The U. S. $100 bill is used for all kinds of purposes-- in some countries it is the preferred form of savings. In others it is the best exchange medium, because its value is more or less reliable. If, for example, you are in Russia the value of the ruble is totally unreliable, so a hard currency like the pound or the dollar or the mark is the best thing to use for trade or to use for saving-- so there is a great demand for U. S. currency in such places.

This demand naturally makes counterfeiting a very attractive proposition, so the U. S. dollar is a favorite target. Not only is there great demand, as I have said, our Treasury's soft steps on security make our currency much easier to counterfeit than, say, the British pound note. If counterfeiters manage to get much phony money into circulation, the value of our currency will the threatened.

Currently, as I have said, there are phony $100 bills in circulation of stunning quality-- they are printed on paper that is virtually identical to authentic U. S. note paper. The

engraving is correct, except for one or two tiny microengraving details, which are virtually impossible to detect. These bills carry varying serial numbers, so they can't be detected by use of the serials. These particular bills are of authentic coloring, and they are printed impeccably-- apparently on intaglio presses.

It is these counterfeits that have forced the Federal Reserve to recall and destroy old $100 bills as rapidly as possible, and to replace those bills with the new type incorporating security strips. As I said, about one third, or $50 billion, of $100 bills are circulating in this country. It will take perhaps one more year to replace all the old bills in domestic circulation, in a program that started several months ago.

Overseas, where most of the bills are, it is a different story. These bills do not come into U. S. bank hands very often, and so they are not returned to the Federal Reserve for destruction. In other words, for most $100 bills, the replacement program will work only slowly, which means that overseas the counterfeiters have a fatter and slower target.

Here in the United States, there has been a relative handful of phony $100 bills found-- the rate recently was about 9 to 11 bills per million processed, amounting to about $1 million per year. But bills that circulate overseas are not processed by the detection techniques needed to spot the new type of counterfeit, so no one knows what the volume of counterfeits abroad really is. The trouble is, it could be very big, and if it is, there is a substantial threat to the books of the Federal Reserve, and to the

value and acceptability of a very sizeable portion of our whole currency base. In other words, better than one third of our currency base-- that is, the $100 bills circulating abroad-- is wide open to the most sophisticated counterfeit operation ever seen.

It is good that the Federal Reserve is working to replace existing $100 bills. But that is not enough to meet the threat, by any means.

What is needed is a much more aggressive effort to provide secure currency, by the Treasury. The steps it has taken have been slow, they have been pitifully inadequate, and they make the threat to our currency much more substantial, inviting counterfeiters to do great harm to out country. If Treasury inaction leads to panic, that wold be tragic-- and it is certainly not impossible for this to happen.

What could be done?

For one thing, there could be a fairly radical revision of our currency-- which would make it much more secure.

Great Britain, for example, completely redesigns circulating bills about every ten years. This is not just to keep things fasionable-- it is to prevent counterfeiting. A few years ago, British 50 pound notes were so compromised that the whole series had to be wiped out in very short order. From that time, they started using much better defenses-- new paper, new inks, new designs-- and today have a much more secure currency. Do we have to wait for a very expensive disaster to do the same kind of thing?

I hope not.

One of the best techniques available today is to use a bigger portrait on the bill. The bigger portrait-- which you will find on just about every currency in Europe-- is much tougher to duplicate. What is better, the type of design used in these portaits cannot be succesfully photocopied-- a copy comes out with gross distortions that are easily visible to the naked eye. This makes it nearly impossible to produce fake bills that look right. But the Treasury, not wanting to change the way our bills look in any fundamental way, resists the idea of this kind of change.

Another thing that can be done is to use more color. If this is done, the resulting bill not only looks more dramatic, but much more important, is extremely hard to reproduce with the proper effect. It is tougher to print, harder to get the colors right, and harder to get the design straight. Again, most European currency uses much more color than ours-- not because it is cute, but because it is more secure and harder to fake. But again, the Treasury resists this idea.

It is fine to use the security strip, but this is of no help when two thirds of the bills in question are overseas and not likely to be replaced very fast-- and meanwhile, the existing bills present a very fat target.

The Treasury should be thinking about much bolder techniques, but is instead playing with small engraving changes and the like. It doesn't even consider very seriously the use of inks that vary with light, and have a distinctive color shift that is very hard

to duplicate, and hence safer than present inks. They should be thinking about more radical changes in design, like bigger portaits, more color, and papers with greater security features than the anti-copying strip-- but they aren't.

All of this invites counterfeiters to trash the $100 bill, and they are doing so with increasing success.

We know that more can be done to protect our currency. My question is, why isn't it? Is it because the Treasury wants our money to look the same always? I say that if it looks like it always has, it won't necessariuly be worth anything at all. Is it because the Treasury doesn't want to invest in new designs and methods? I say that if that is so, we might well end up with a currency that is badly compromised-- and so very expensive indeed.

We cannot pretend any more than photocopying doesn't exist, or that other people can't get their hands on good currency notepaper, or that they can't get access to intaglio presses, or that they can't come very close to duplicating our inks-- they have done all those things. The truth is, there are worthless $100 bills in circulation-- no one knows how many-- that are indistiguishable from the real thing, unless you have access to certain mechanical testing devices. These fake bills could not exist if the Treasury had done its job and employed security techniques that are well known, very effective, and used by governments that want a safe currency. What are we waiting for? There is, after all, $100 billion in $100 bills abroad that are at great risk, and $50 billion worth here at home that are at greater

risk than they really should be. Is it any wonder our currency is being attacked? Not at all. The wonder is how little we are doing to protect it.

BILL McCOLLUM FLORIDA
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TASK FORCE ON TERRORISM &
UNCONVENTIONAL WARFARE
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U.S. HOUSE OF REPRESENTATIVES
WASHINGTON, D.C. 20515

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[illegible]
DONALD J MCINTOSSEY
LEGISLATIVE DIRECTOR
JAMES L GOODLETTE II
COUNSEL
SCOTT BRENNER
PUBLIC AFFAIRS
[illegible]
202/225-0176

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July 1, 1992

CONTACT: SCOTT BRENNER
(202) 225-2176

McCOLLUM ACCUSES IRAN AND SYRIA OF POLICIES TANTAMOUNT TO "ACTS OF WAR"

Rep. Bill McCollum (R-FL) released evidence today showing that the governments of Iran and Syria are actively engaged in economic warfare against the United States through the production and dissemination of high quality counterfeit dollar bills.

"The Task Force on Terrorism and Unconventional Warfare is releasing this report because of numerous news reports on this topic in Europe, the Middle East and the United States," McCollum said. "But most importantly the recent report in the Iranian English language newspapers accusing the U.S. intelligence agency of counterfeiting U.S. $100 dollar bills. This is factually not true.

"Iran appears to be flooding Central Asia, Africa and perhaps the U.S. with huge quantities of counterfeit U.S. dollars it is producing and has the gall to claim that the U.S. is producing and circulating these bills."

Commenting on the report in a Washington press conference, McCollum said that he considers the actions of the two governments tantamount to an act of war.

"An attempt to destablize our country's economy by producing counterfeit money in hopes of undermining confidence in the dollar around the world is a serious threat to our national interest," McCollum said. "It is essential that the United States respond appropriately to this threat."

The report produced by the House Republican Research Committee's Task Force on Terrorism & Unconventional Warfare which McCollum chairs, lays out how Iran, in an attempt to rebuild its economy in the wake of the Iran-Iraq war, conceived of a strategy to produce high-quality counterfeit U.S. money to make up for its hard currency needs.

The report goes on to say that as Iran's counterfeiting campaign was expanded, Teheran began to look toward Syria and its terrorist and drug connections for outlets which to circulate its counterfeit dollars. The report says that the highest officials of Syrian intelligence supplied counterfeiters with official government passes to travel freely throughout Syrian territory.

The counterfeit currency is infiltrated into the international marketplace largely through drug money laundering. The currency is first tested locally in the Middle East and is then expanded to Europe.

McCollum
add 1

McCollum said he did not know exactly how much counterfeit money was in circulation.

"I believe there is the potential for billions of dollars of counterfeit U.S. currency to soon be in circulation, mainly outside of the U.S. banking system," McCollum said. "Evidence in this report supports estimates that such sums may already be in circulation. The implications for the dollar's role as the international medium of exchange could be serious."

Also attending the press conference with McCollum were:

Rep. Duncan Hunter (R-CA), Chairman of the House Republican Research Committee

Vaughn Forrest, Chief of Staff for the Task Force on Terrorism and Unconventional Warfare

Yossef Bodansky, Director of the Task Force

Dr. Assad Homayoon, An Iranian exiled leader and former Minister of Iranian Embassy Washington

Rachel Ehrenfeld, Ph.D, research scholar, New York University School of Law and author of Narcoterrorism, and Evil Money.

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HOUSE REPUBLICAN RESEARCH COMMITTEE
U.S. HOUSE OF REPRESENTATIVES
WASHINGTON, D.C. 20515

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JAMES E. GEOFFREY II
EDITOR

SCOTT BRENNER
PUBLIC AFFAIRS

1622 LONGWORTH BUILDING
202/225-0871

Executive Summary
IRAN, SYRIA AND THE
TRAIL OF COUNTERFEIT DOLLARS
July 1, 1992

- The Iranian Government, in cooperation with Syria, has undertaken a massive counterfeiting campaign in order to alleviate their financial difficulties and pursue economic warfare against the West.

- The origins of this strategy go back to Iran's efforts to rebuild its economy in the wake of the Iran-Iraq War. When it became apparent that Iran's exports could not meet its hard currency needs, the plan for a counterfeiting operation was devised.

- As Iran's counterfeiting campaign was expanded, Teheran began to look toward Syria and its terrorist and drug connections for other outlets with which to circulate its counterfeit dollars.

- Utilizing the expertise that Iran had developed during the Shah's Government for the manufacture of currency, the Khomeyni regime was able to develop sophisticated printing techniques that generated nearly perfect duplicates of American currency.

- The counterfeit currency distributed by Iran, Syria and their agents, is infiltrated into the international marketplace thrcugh drug money laundering by banks. The currency is first tested locally in the Middle East and is then expanded to Europe, and ultimately, with the aid of HizbAllah networks, the United States.

- In addition to circulating counterfeit currency through the drug network, Iran also passes the currency throughout the former Soviet Central Asian Republics, often by offering it as bribe money to local officials.

- It is estimated that the potential is there for billions of dollars in counterfeit currency to soon be in circulation, mainly outside the US banking system. Evidence in this report supports estimates that such sums may already be in circulation. Although the exact figure cannot be determined, the implications for the dollar's role as the international medium of exchange could be serious.

BILL McCOLLUM FLORIDA
CHAIRMAN

DANA ROHRABACHER CALIFORNIA
CO-CHAIRMAN

MEMBERS

WILLIAM BROOMFIELD MICHIGAN
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IRAN, SYRIA AND THE TRAIL OF COUNTERFEIT DOLLARS

July 1, 1992

Evidence has recently come to light that the governments of Iran and Syria are actively engaged in economic warfare against the United States through the production and dissemination of high quality counterfeit dollar bills, primarily in $100 denominations. The objective of this campaign is twofold: (1) To alleviate the dire financial crises in both Iran and Syria, and (2) To destabilize the United States' economy by undermining confidence in the dollar. In executing this strategy, the actual smuggling of the bogus currency and its distribution to international financial centers has been carried out via the international terrorist networks that Iran and Syria control.

The decision to embark on a campaign of counterfeiting high quality dollar bills was reached in Syria and Iran in 1989-1990, as both governments became aware of an impending shortage of hard currency. Both Damascus and Teheran realized that the shortfall in hard currency assets could not be made up through the conventional export of goods, and since both typically were not granted easy credit and loans in the international market, there was no way to meet the crisis.

In the meantime, by the late 1980's, Syria and Iran were already involved in the international drug trade, with revenues from illicit activities constituting a sizeable fraction of their GDPs. For example, in the period running from 1987 to 1990, the average direct annual income to various Syrian government agencies from the illegal drug trade was about $500 - $700 million. With other indirect and complementary income included, a total of up to $1 billion reached the Syrian Treasury in 1991 alone. This sum constitutes about 10% of the Syrian GDP. In addition, key Syrian officials have derived immense personal fortunes from skimming off of the top the assets brought in by drug transactions. Thus, Damascus and Teheran began to realize

that criminal activity would be profitable to their national treasuries.

This fact fit neatly with the Iranian view that the United States was a land preoccupied with the adulation and worship of money. Thus, Majid Anaraki, an Iranian Hizbollahi who had lived several years in southern California, described the United States as "a collection of casinos, supermarkets and whore-houses linked together by endless highways passing through nowhere," all dominated and motivated by the lust for money. "Those people in the West will put their own mothers on auction for profit," explained Behzad Nabavi, then Iran's Minister of Heavy Industries. Indeed, Khomeyni himself pointed out that the Western preoccupation with the quest for money makes "prostitution a community's way of life."

Little wonder, therefore, that in the aftermath of years of intense propaganda of this type, itself an outgrowth of Iran's ideological crusade against the West, several Iranian officials came to believe that, by hurting the American financial system, they would be striking at the very soul of the United States.

In any case, by the late 1980's, Iran was facing a severe financial crisis. In the aftermath of the war with Iraq, Iran was faced with a massive rebuilding effort. The direct and indirect costs of the Iran-Iraq War came to more than $600 billion. Thus, Teheran embarked on a "Reconstruction Jihad" as its primary national goal. In this context, the Iranian assessment of foreign currency needs for the 1989-1993 five year plan called for a foreign currency budget of $22.4 billion a year, including $6.5 billion for industrial rejuvenation, $3 to $4 billion for security costs, $4.5 billion for food imports, and $1 billion for scholarships and diplomatic expenditures. This came to a total of $15 to $16 billion in declared expenditures.

Meanwhile, a continued decline in oil prices further complicated the Iranian financial situation. In its 5 year plan, Teheran had already anticipated only $13 billion in annual oil revenues on the basis of a price of $19 a barrel. However, by 1992, oil prices had dropped to $16 a barrel, further aggravating Teheran's financial difficulties.

Consequently, Teheran was anticipating an annual deficit of $9.4 billion in its hard currency requirements. (The non-oil hard currency revenues, officially some $1 to $1.5 billion comes mainly from servicing foreign debt to Iran by Islamic and Third World countries - money that Iran does not really receive.) Thus, it appeared to Teheran that there would be no getting around having to borrow under harsh terms. Indeed, by early 1992, Iran's foreign debt reached

some $34 billion, with no indication of a reduction in the growth of the national deficit.

In the meantime, Teheran was developing an even more ambitious hidden agenda, namely the resurrection of Iran as a regional power. Toward that end, Iran embarked on a multitude of national strategic projects ranging from the development and acquisition of nuclear and other strategic weapons, to a massive modernization and build-up of conventional forces, to a marked increase in the financing of Islamist revolutionary activities, including terrorism and subversion. Taken together, in order to expedite this strategic build-up, Teheran allocated vast hard currency sums, estimated at $10 billion between March 1990 and November 1991. This money was appropriated outside the official budget.

Furthermore, Iran simultaneously undertook a major campaign to win over the former Soviet Central Asian Republics to its diplomatic and economic orbit, a project requiring massive financial commitments. A large portion of this money, already estimated at several billion dollars, was also appropriated outside the national budget.

Thus, as of 1989, Teheran was in dire need of large quantities of hard currency for the pursuit of its national strategic agenda, as well as for the Reconstruction Jihad. Teheran's financial needs exceeded $10 billion a year, and there no viable source for this money seemed forthcoming, especially not for the funds needed to further Iran's overall grand strategy.

Little wonder, therefore, that the Iranian leadership, including President Ali Akbar Hashemi-Rafsanjani, reached the conclusion that only drastic and unconventional steps could bring about a solution to Iran's financial problems. Thus, the Iranian government's decision was to print high quality counterfeit American currency. Such a step would both provide Iran with some desperately needed hard currency while, at the same time, causing tremendous damage to the American economy.

Thus, Teheran committed itself to undertake this project by early 1990, and almost immediately, the IRGC Intelligence and SAVAMA began dispatching senior operatives to the West to search for and buy needed items to implement the plan. Meanwhile, high level negotiations began with Syria to obtain the use and expansion of their drug smuggling networks and connections in order to distribute some of the counterfeit money.

* * *

Iran and its allies produce and distribute the counterfeit US banknotes in three qualities ranging from extremely high quality to medium and to low, the last of which is, despite its designation, quite good. Special attention is paid to the high quality $100 bills because these are employed directly against the American banking system. (Smaller quantities of $20 bills are also being produced.) The low and medium quality bills, both $100's and $20's, also constitute a strategic threat to the United States because of the nature of their use.

The difference in the quality of the forgeries is also reflected in their price. In Beirut, the last safe distribution point to the West, the price of the high quality counterfeits is 40 cents on the dollar for on-site delivery, and 60 cents on the dollar for delivery to the ultimate destination. These prices apply to key Lebanese distributors, such as Abdul Annan, operating under the direct patronage of Syrian Intelligence. Despite their relatively high price, the high quality counterfeit dollars are most popular because of the ease with which they can be deposited in major banks in the West, including the United States.

The high quality counterfeit $100 bills are printed in the Iranian official mint in Teheran, using equipment and know-how purchased from the United States during the reign of the Shah. Seeking to establish the Iranian currency, the rial, as the region's hard currency, the Shah acquired from the United States quality equipment for currency printing and sent its experts to study the latest money making techniques with the United States Treasury Department. Consequently, Iran had developed a cadre of experts familiar with Western currency printing techniques by the late 1970's.

After the Khomeyni revolution, these experts continued to serve Teheran. Needless to say, the expertise acquired by Teheran during the Shah's government is reflected in the quality of the Iranian banknotes that were issued both before and after the revolution. These notes clearly show a high order of workmanship. The Iranian experts were also able to remove water marks and other US-style safety precautions and instead introduce fine calligraphy and complex graphics to Iran's currency. Indeed, the quality and technical complexity of Iran's banknotes testifies to the fact that from the very beginning, the Khomeyni regime has retained highly skilled Iranian print technicians and artists at its national mint.

These artists and other experts are now employed in the printing and production of American $100 bills. Indeed, Israeli officials stated that these "dollars" are being

printed on "high tech, state owned presses with paper acquired only by governments." These are made with US built high speed precision printing machines located in the Central Bank Print Installation on Shohada street in Tehran, and the handling of the notes is completed in a secure compound just outside Teheran on the road to Merhabad airport.

In addition, since early 1990, IRGC Intelligence has sent some of its senior operatives to shop for specialized items, primarily paper, in Western Europe. For example, Hassan Mashhadi Ahawashi, who is currently Iran's ambassador to the disarmament talks in Geneva, is also a senior official of IRGC Intelligence. In 1990, he was in charge of the purchase of high quality paper in Europe and made one deal for very specific paper. However, although the paper fit the official specifications given to the producer, IRGC Intelligence rejected the deal because the paper was found not suitable "for the real objective/mission for which [it was] purchased." (Teheran, needless to say, was angry that Ahawashi had not paid attention to the hidden, yet highly important, agenda in paper acquisition.)

Nevertheless, by the end of 1990, Iran had acquired sufficient quantities of specialized paper to permit a complex process of reverse engineering. Consequently, some of the paper, primarily for the medium quality counterfeits, is now being produced in a large factory just outside Teheran. The high quality notes are printed on a combination of imported and locally produced paper, with the local paper gradually becoming the dominant material.

The plates used for the $100 bills are virtually perfect and are used for all the counterfeits. The ink is almost always of extremely high quality, and the specialized ink is mixed in the laboratories of the national mint in Teheran by chemists who had studied in the United States. The design, engraving, ink mixing and other preparatory activities are conducted in a central facility between Takhte-e Tavoos Street and Takhte-e Jamshid Street in Teheran.

The main difference in counterfeit quality as compared to genuine dollars can be seen in the thickness of the paper and the strength of the press of the crown and series-letter on the bill. These differences are mainly felt on brand new bills, but are less apparent on much used bills. In addition, low quality $100 and $20 bills are also printed on thin and flat paper. These counterfeits are produced in the Bekkaa valley of Lebanon for operational use in the Middle East and the Third World, mainly sub-Saharan Africa, to supplement the demand for bribery cash whenever Iranian high quality paper is not available. (The HizbAllah developed and currently runs this "forgery industry" in the Bekkaa.)

The initial distribution of the counterfeit money is centrally controlled by the highest levels of the Syrian Government, with the actual handling of the currency being conducted by Military Intelligence from Lebanon.

The direct supervision over the counterfeit dollars can be traced to General Muhammad al-Khouli, the head of the Syrian Presidential Security Council. Since General Khouli is the senior confidant and special messenger of President Hafiz al-Assad, it is unlikely that he would undertake even the smallest move without direct approval from the President. (Until recently, General Khouli was the all-powerful head of Air Force Intelligence and was in direct control of international terrorist operations in the West, especially Europe. In particular, Khouli has directed such key operations as the bombing of the LaBelle Disco, the attempted bombing of an El Al Boeing 747 in London, and the destruction of Pan Am Flight 103. Further, by January 1986, Khouli had already claimed to have directed 29 terrorist operations in the West.)

The actual control of the smuggling operations, as well as related drug affairs, are conducted through Military Intelligence, under the personal supervision of its commander, General 'Ali Duba. General Duba, the head of the Syrian Military Intelligence and Security Forces, and a close Assad associate, runs a very tight organization. (For example, it was Duba who determined the extent of the involvement of Syrian Intelligence personnel in all criminal activities in Lebanon and Syria.) Moreover, for several years now, General Duba has directly coordinated the main financial transactions of drug money for the benefit of the Syrian Treasury and his own pocket book. This responsibility was expanded in 1990-1991 to include the handling of profits from the counterfeiting operations.

Thus, boxes full of Teheran-made counterfeit dollar bills are flown to Damascus on the Iran Air special weekly flights that also bring equipment and other goods for Syrian Intelligence, the HizbAllah, and other terrorist organizations. The Boeing 747 is unloaded in a secluded area of the Damascus airport. From there, the counterfeit money is delivered in bulk to Zabadani, the Iranian forward base in Syria that is being jointly run with Syrian Intelligence. After this, the counterfeit cash is packed in small quantities and prepared for further delivery overseas via Lebanon based networks. (See Figure 1.)

It is in Zabadani that Syrian Military Intelligence assumes direct control over the operation. The Syrians orchestrate and oversee the delivery of the counterfeit money from Zabadani to the smuggling networks in the Bekkaa and Beirut.

These networks are already tightly controlled by Syrian intelligence and are committed to drug smuggling, as well as weapons and other smuggling operations for Syrian and Iranian international terrorist groups.

The man who actually runs the counterfeit money smuggling operations in and out of Lebanon is Brigadier General Ghazi Kan'an, officially the head of the Syrian Security and Intelligence branch in Lebanon, and in effect the Syrian viceroy in Lebanon. Ghazi essentially controls all activities on the ground through political patronage and the issuing of passes, some personally signed by him, from Syrian security authorities in Lebanon. Such a pass permits the bearer "to pass freely, with his personal weapon and merchandise, within the physical area of Lebanon, for security reasons." (See Figure 2.) Although sanctioned by Damascus to insure tight control over the smuggling operations, these passes still cost the smugglers large sums of cash, the proceeds from which go both to the Syrian Government and to the official signing the pass.

In any case, the most important Lebanon based networks smuggling the counterfeit dollars have evolved from the international networks that are already involved in the smuggling heroin and cocaine. These networks operate under the tight control of, and with extensive assistance from, Syrian Military Intelligence. Indeed, senior officers take direct part in facilitating the safe shipment of counterfeit bills from Lebanon.

For example, the operations of Muhammad Rahal of West Beirut and his overseas agent, Jamal Muhammad al-Marsi, a.k.a. Senegal, could not have taken place without Syrian assistance. Rahal smuggles large quantities of counterfeit dollars that are hidden inside Italian furniture he imports to Beirut. After modifications are made to the furniture to transport the counterfeit money, Rahal exports the furniture to the United Arab Emirates, from where al-Masri reships both the money and the furniture to their final destination. The entire Beirut operation is run and coordinated by Syrian Intelligence.

Al-Masri has close relations with Rustum Ghazalah, the commander of Syrian Intelligence in the Beirut area, who acts as a patron to the Rahal activities. Indeed, Colonel Hani al-Ali, Ghazalah's special aid, personally supervises the safe loading and shipment of the Rahal furniture in Beirut International Airport, making sure that there are no inspections or other interference.

Another major player involved in large-scale high quality counterfeit dollar distribution is the Keyrouz clan of Dir

al-Ahmar, long notorious as a major drug dealer and personal protege of Gens. Tlass, Duba, and Kan'an. Recently, two members of the Keyrouz clan, Hanna and Georges (Giryes), offered to sell $100,000 in high quality fake $100 bills for a lump sum of $50,000. The involvement of the Keyrouz clan is of crucial significance because the heads of the clan were among the Lebanese mediators responsible for the first contacts leading to a deal between Syria and the Medelline drug cartel. (For details, see the GOP Task Force Report on Narco-terrorism.) Thus, the Keyrouz clan now capitalizes on its contacts with international drug cartels to assist in the distribution and laundering of large sums of high quality counterfeit money, especially in Latin America and the United States.

A significant portion of the counterfeit dollar bills are being distributed on behalf of Iran by HizbAllah networks as part of their smuggling and logistical efforts. HizbAllah uses well established networks with proven records of success in smuggling drugs, weapons and explosives, as well as intelligence operatives and terrorists.

For example, Ali Yaghi of Ba'albak, long affiliated with the HizbAllah, is responsible for the supply of $100 and $20 counterfeit bills for distribution in southern Europe. The Yaghi clan operates with direct assistance from Syrian intelligence, for whom they also smuggle drugs.

Another example is that of Mahmud Hassan al-Irani, a senior HizbAllah intelligence official, who operates from a Beirut bakery. He is responsible for arranging the use and/or distribution of fake $100 and $20 bills in the West, as well as for obtaining forged visas for HizbAllah operatives going overseas.

Also active is Imad Fadlallah, a relative of Ayatollah Muhammad Hussayn Fadlallah, the spiritual leader of the HizbAllah, who coordinates a major portion of the smuggling of counterfeit dollar bills from West Beirut to and via west Africa. His two half brothers, Fayiz and Adham, live in Ivory Coast where they handle the African side of the operation. This method of communication is mainly used for smuggling counterfeit money and drugs into Western Europe, especially France.

The expansion of the drug smuggling operations to include the distribution of counterfeit dollar bills immediately increased the importance of the relations between Syrian Military Intelligence and their proteges among the Lebanese political elite. A country immersed in patronage politics and the drug culture, Lebanon is extremely vulnerable to the ruthless power plays of General Kan'an on behalf of Damascus.

The intimate and direct involvement of Syria in both the smuggling process and Lebanese politics make the distribution of counterfeit money a state affair, and, at the same time, strengthens the Syrian hold over Lebanon.

Indeed, one of the first Lebanese political clans to throw in its lot with Damascus is the Mansur clan, under the leadership of Albert Mansur. A Member of Parliament from the Bekkaa since 1972, representing the local Greek Catholic community, Albert Mansur is currently Minister of Information in the Lebanese Government. Although the head of a traditional power family, Mansur owes much of his political power to purges conducted by Syrian Intelligence and Commando forces under the command of Rifat Assad and Ghazi Kan'an soon after the 1976 Syrian invasion of Lebanon. The Syrian forces removed Mansur's potential enemies, thus consolidating both his power and his dependence on General Kan'an.

Meanwhile, the Mansur clan has been processing poppies to extract opium and heroin in the Ba'albak area, being one of the primary clans overseeing local laboratories. Albert Mansur himself uses his close relations with the Syrian authorities, mainly General Kan'an and President Hrawi, to provide patronage and protection for the drug processing labs in the Hermel and Ras-Ba'albak areas on Kan'an's behalf. Mansur also arranges for his proteges to have access to the lucrative counterfeit distribution network, including required documents like safe passage certificates, from Syrian Military Intelligence. Mansur is paid handsomely for all of these services on behalf of his constituents. (A few weeks ago, Albert Mansur escaped to Paris, where he now hides.)

Additionally, the Jaffar clan, one of the major smugglers of counterfeit dollar bills and drugs to France and Western Europe, is also thriving as a direct result of relations with Syrian Military Intelligence. Ali Hamad Jaafar, the head of the clan, is a Member of Parliament from Ba'albak. Ghazi Kan'an is a close ally, political patron, and personal friend of Jaafar. Under Syrian protection, Jaafar's son, Yassin Jaafar, smuggles high quality counterfeit dollar bills and heroin to Europe.

Another major counterfeit money and drug smuggling operation directly dependent on Kan'an's patronage is run by Mohammad Deeb Awada, the mayor of Ba'albak. (Awada was appointed to his position by Kan'an himself.) Awada's heroin processing lab is located in a building adjacent to the headquarters of Syrian Intelligence in Talya, in the Bekkaa. The main storage facility of the drugs and counterfeit money produced by Awada's operation is in Ouzai, west Beirut. Mustafa Assaf and Hajj Abbas Chamas are the main export agents and partners

of Awada. In addition, two of the Chamas brothers, Ali Hussayn Chamas and Muhammad Hussayn Chamas, are in charge of storage site security. Ali Narsi Chamas, the brother in law of the Chamas brothers and a German citizen, is the main courier to Europe.

Awada's close relations with Syrian Military Intelligence are reflected in his smuggling operations. Awada ships his goods via Beirut International Airport and Tripoli harbor, both tightly controlled by the Syrian forces. Lt. Col. Muhsin Salman, the Syrian commander at the airport, oversees air smuggling operations to Western Europe and has direct business relations with several major drug smugglers. In addition, he personally assists in the Awada shipments and regularly sends his aid, Lt. Col. Suleiman, to ensure the smoothness of the shipments. Syrian Military Intelligence is currently using the Awada smuggling operations to improve and expand their networks in Western Europe, especially Germany.

* * *

Teheran and Damascus are very prudent in distributing their high quality counterfeit dollar bills. For the first 18 months of their concentrated distribution efforts, the Iranians and Syrians gradually expand the circle of financial institutions and banks infiltrated by large quantities of counterfeit money in order to insure that they will not be detected. The high quality counterfeit bills first emerge in the Middle East, where they are tested on local branches of foreign banks. When it is clear that large quantities of the counterfeit cash have not been detected, the distribution efforts expand into Western Europe, primarily France, again to both local and foreign banks. Only when Teheran and Damascus are convinced that their high quality counterfeits will pass the scrutiny of sophisticated banks will they begin large scale distribution to the United States and Canada.

HizbAllah officials are responsible for the distribution of the counterfeit $100 bills in the US and Canada on behalf of Iranian Intelligence. Quantities of counterfeit money are smuggled into the US and Canada along the routes that have been found to be secure by HizbAllah and other terrorist organizations for the smuggling of explosives, weapons, drugs and terrorist operatives. Additionally, the chiefs of IRGC Intelligence and the SAVAMA assure that the modes and avenues of entry into the United States are safe, and thus can sustain a high volume of shipments without being detected.

The HizbAllah and its associates use several methods to disperse large quantities of counterfeit dollars in the United States. The most effective method of dispersal is to capitalize on the massive laundering of drug related cash by

major banks and financial institutions. High-quality counterfeit dollars are mixed with large cash deposits in narco-money laundering banks, making up as much, at times, as 10 to 30% of the deposited money. Only a small fraction of the counterfeit money is discovered by the banks. The masters of narco-terrorism know that money laundering banks are too mesmerized by the lure of easy profits from drug money, (and are too afraid of retaliation by drug dealers), to complain to the authorities about the counterfeit money they discover. Instead, the banks quietly absorb the losses and continue laundering the entire deposited sum.

The HizbAllah is also using counterfeit money for one-time purchases of "forbidden goods," such as equipment needed by Iran, in the black market. They also use counterfeit money as excess cash for intelligence operations, for one-time bribes, as well as for obtaining special services from local criminals. The success of these uses of counterfeit money is dependent upon the assumption that the victims will not complain to the police for fear of being accused of being accessories to the crime and because the authorities cannot effectively punish the HizbAllah terrorists.

In addition to this, large quantities of high quality counterfeit dollars, several tens of millions, are stored by the HizbAllah as cash for emergency uses. Indeed, Teheran is correct in its assumption that there is no logic is storing millions in real cash if cheaper bogus money can be stored instead. The money in question will be used to obtain services illegally from the underworld in the aftermath of a major crisis, such as a major terrorist attack.

In addition to the networks described, Iran and Syria have other major avenues for the distribution of their counterfeit money, including the medium quality bills.

For example, the new republics in ex-Soviet Central Asia are a bottomless pit for counterfeit dollars. Local officials, and virtually everybody else, seek cash payments, especially for bribes, in dollars. However, these individuals do not know the shape of American dollar bills well enough to notice the counterfeits. Thus, even as the cost of subverting Central Asia rises, Iran can overcome many of its financial difficulties by distributing counterfeit money.

Similarly, counterfeit dollars are useful in financing illegal and semi-legal weapons acquisition efforts in Russia and Eastern Europe, especially the payments to, and bribing of, key individuals. In many cases, large quantities of weapons become available quite suddenly when a few senior officials decide to sell them for large amounts of hard currency. With cash being delivered in large suitcases and

crates, it is not difficult to include a large portion of counterfeit bills inside the stacks. This form of weapons acquisition in becoming very popular in Eastern Europe and the Ukraine.

For example, since May 1992, Syrian military representatives have been traveling in Czechia, Slovakia and the Ukraine with some $800 million in cash trying to buy strategic weapons, including nuclear warheads and high performance weapons systems for immediate delivery.

Furthermore, low and medium quality counterfeit dollar bills are used to support deals in central and west Africa conducted by local Shiite Lebanese and activist Muslim communities. The counterfeit money is used for various purposes ranging from the "greasing" of deals to special services rendered to fueling rampant local corruption. The corruption in central and west Africa is estimated at several hundreds of millions of dollars a year, and at least 25% of the money is counterfeit.

* * *

Iraq is an excellent example of Teheran's methodical and calculated use of counterfeit money as both strategic weapon - i.e. to destabilize the Iraqi economy - and as a secondary route for confronting the West - since Iraq uses hard currency to get around UN trade sanctions. Teheran is aware that those in the West who violate the UN sanctions, selling forbidden goods at exorbitant prices, are unlikely to complain if they discover that a fraction of the illegal payments they received are high quality counterfeits.

Thus, since the Spring of 1992, Iran has flooded Iraq with both high and medium quality counterfeit 100 and 20 dollar bills. The Iranians direct this money to the underworld and black market circles associated with Iraqi Intelligence. For example, they include counterfeit dollars in payment for "stolen" cars and other mechanical equipment that is sold across the Iranian border. The hard currency collected in this way is used for the purchase of black market consumer goods, mainly in and via Jordan, as well as to finance some of the illegal acquisition of goods for the Iraqi military system.

Baghdad tacitly permits the importation of black market goods in return for the smugglers acquiring materials to help in the national rebuilding effort. For its part, Teheran is determined to consolidate its hegemony over Iraq by, among other methods, developing dependence on violations of the UN sanctions across the Iranian border. Thus, by undermining confidence in Iraqi cash purchases in Jordan and the West,

Iran forces Baghdad, both the government and the black marketeers, into a greater reliance on Iran. In the meantime, additional quantities of counterfeit dollars are put into circulation in the West.

Teheran and Damascus also use the counterfeit dollar bills for the financing of terrorist operations in the Third World, Western Europe and the United States. The use of counterfeit dollars is intended to hurt the economy of the West, inflicting damage upon it by attacking its essential store of value.

* * *

What are the implications for the United States' economy of this effort by Iran and Syria to distribute high quality counterfeit $100 bills? The real effect depends upon just how much counterfeit money is in circulation.

As a rule, US currency is difficult to counterfeit because of the intricacies of the engraving process, the unique paper, and the printing process. However, once counterfeit notes of quality are printed, it is extremely easy to circulate and disseminate large volumes of them. Moreover, when the distribution of such counterfeit money is conducted within the context of the large scale money laundering that goes on as a result of the drug trade, there is little or no restraint on the volume of counterfeit money that can be put into circulation and laundered.

This raises the question of just how much money is involved in the distribution effort. There is no way of determining how many counterfeit bills were printed in Teheran and distributed by Syria and Iran. In early 1992, press reports estimated on the basis of the quantities of high quality bills discovered that some $100 million were already in circulation in the West. Because offshore and foreign banks absorb their losses and do not report the counterfeits discovered in the drug money they are handling an accurate picture of the volume of counterfeit currency in circulation cannot be based on the normal reporting proceedures available to the U.S. Treasury. The probability is that previously published estimates of Iranian produced counterfeit bills in circulation are grossly low.

In reality, in 1991, the first year of the all out dissemination effort by Syria and Iran, the dissemination efforts could not have possibly reached full capacity. However, in 1992, there is no reason to believe that marked expansion of the flow will not take place. The potential is there for billions of dollars of counterfeit U.S. currency to soon be in circulation, mainly outside the U.S. banking

system. Evidence in this report supports estimates that such sums may already be in circulation from the Iranian counterfeit operation.

If the Iranian/Syrian counterfeit operation is not stopped the continued spread of counterfeit dollars throughout the world could ultimately erode the unique position of the dollar as the world's medium of exchange. Such a situation could have very serious implications for the American economy, and indeed for the world's. Quite possibly, several holders of large quantities of US dollars, such as Third World national banks and leaders, might decide to cash in their dollars for gold or other commodities.

Thus, taken together, the unchecked circulation of high quality counterfeit dollars by Syria, Iran, and their agents could end up having a ripple effect of adverse implications for the US economy. With the counterfeit bills themselves so difficult to locate and identify, the only viable solution may be to go after the sources of production and circulation for this fraudulent currency, namely Teheran and Damascus.

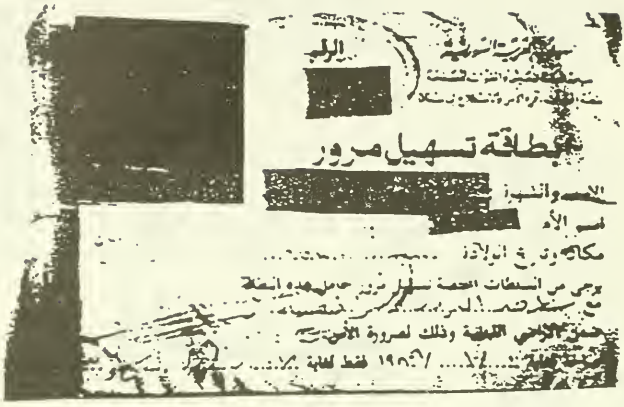
by Yossef Bodansky
& Vaughn S. Forrest

(This paper may not necessarily reflect the views of all of the Members of the Republican Task Force on Terrorism and Unconventional Warfare. It is intended to provoke discussion and debate.)

FIGURE 1

The Money Trail
Iran
Tehran
By air from Tehran
Hermel
The Bigaa
Baalbak
Zabadani
Damascus
Syria
Overseas by boat
Tripoli
Mediterranean Sea
Overseas by air
Beirut
Lebanon
Israel
Major Shipments
Middle Eastern Region

FIGURE 2



TRAVEL DOCUMENT (FRONT)

Photograph

The Syrian Arab Republic
General Army Headquarters
Intelligence Division
Security and Intelligence Branch
in Lebanon

PASSAGE PERMIT

First and last name
Father's name
Security Branch, Lebanon
Date/Place of birth

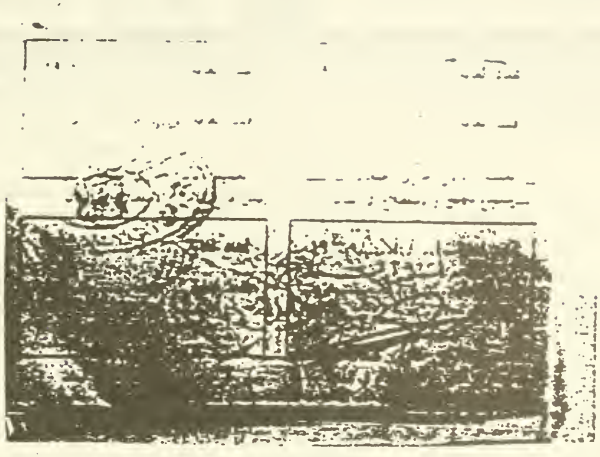
Brig.-General Ghazi Kan'an
Head, Intelligence and

The government (force) is requested to allow bearer to pass freely, with his personal weapon and merchandise, within the physical area of Lebanon, for security reasons.

Date of issue

Valid until - as extended

FIGURE 2 continued



TRAVEL DOCUMENT (BACK)

Valid from
Valid until

Brig.-Gen. Ghazi Kan'an
Head, Intelligence and
Security Branch, Lebanon

Valid from
Valid until

Brig.-Gen. Ghazi Kan'an
Head, Intelligence and
Security Branch, Lebanon

Valid from
Valid until

Brig.-Gen. Ghazi Kan'an
Head, Intelligence and
Security Branch, Lebanon

Valid from
Valid until

Brig.-Gen. Ghazi Kan'an
Head, Intelligence and
Security Branch, Lebanon

DEPARTMENT OF THE TREASURY

TREASURY NEWS

OFFICE OF PUBLIC AFFAIRS • 1500 PENNSYLVANIA AVENUE, N.W. • WASHINGTON, D.C. • 20220 • (202) 622-2960

FOR IMMEDIATE RELEASE
July 13, 1994

STATEMENT BY TREASURY SECRETARY LLOYD BENTSEN

Today we are announcing the Treasury Department's plans to change the design of U.S. currency to enhance its security in this time of rapid technological change.

Last year I charged the Advanced Counterfeit Deterrence Steering Committee, which oversees our deterrence efforts, with the task of assessing and developing features for a more secure currency. The group, chaired by Treasury Under Secretary Frank Newman, has responded quickly to its mandate, and will discuss the program in greater detail at today's hearing before the House Banking Committee.

Our plan, developed in cooperation with the Federal Reserve, is a pre-emptive step to protect U.S. currency from high-tech counterfeiting. This initiative was not undertaken as a result of a crisis or because of any meaningful threat from any particular source. The actual volume of counterfeiting of U.S. currency has been only a very small fraction of the total in circulation. The Secret Service has an outstanding record of enforcement. Two security features introduced in 1991 -- a polyester security thread embedded in the paper and microprinted wording -- have been very effective. But we would risk eventual diminishment of confidence in the integrity of our currency if we did not change it to meet the challenges of a new generation of technology. With diligence, we can ensure the continued security of our currency.

It is vitally important that people around the world understand that all existing U.S. currency will continue to be valid. The re-designed currency will be introduced over a period of years, and no U.S. currency will be demonetized, devalued or recalled.

The testimony today will shed light on the features to be tested and developed in the coming months, and on the process we will follow to put new bills into circulation. The steering committee has examined the emerging technologies accessible to counterfeiters and existing technologies that could be used to make a more secure, more easily verified bill. Its ultimate design will be sufficiently elastic to allow for revisions as new technologies emerge, but will maintain the traditional look of U.S. currency.

(MORE)

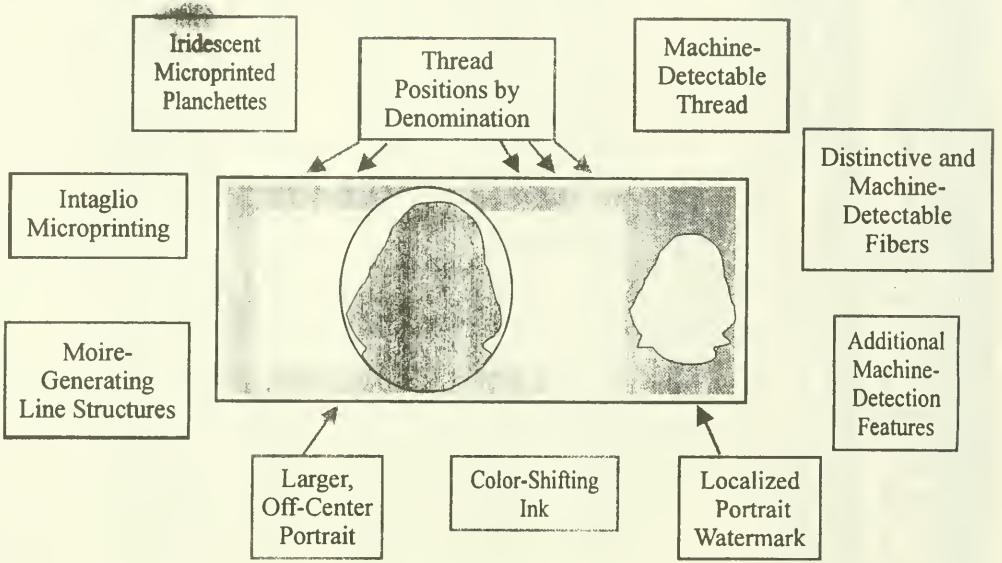
No single feature alone is sufficient and no single currency design can be absolutely counterfeit-proof over time. But with a willingness to re-examine and update our designs, we can stay ahead of the technology curve.

Chairman Gonzalez and other members of the House Banking Committee on both sides of the aisle share our interest in this effort and have encouraged the development of enhanced security features. I would like to thank Chairman Greenspan, Governor Kelley and the Federal Reserve for their work on the Steering Committee. We are happy to take this opportunity to update the Banking Committee on our progress and to announce this important plan.

-30-

U. S. Department of Treasury
July 13, 1994

FEATURES UNDER CONSIDERATION



Shaded portions indicate areas for numerals, titles and traditional engraved borders.

U.S. Department of Treasury
July 13, 1994

DEFINITIONS OF FEATURES

Distinctive and Machine-Detectable Fibers. Special fibers with specific properties are often added to security papers for forensic purposes. Modern security fibers can be designed to incorporate many types of machine-detectable characteristics.

Iridescent Planchettes. Traditional planchettes are colored pieces of tissue paper a few millimeters in diameter incorporated directly into the paper, either in rows or randomly distributed. In newer planchettes, such features as microprinting and iridescence are used to enhance their security.

Security Thread. A security thread is a thin thread or ribbon running through a banknote substrate. It is a versatile feature, with many types currently available, including microprinted, metallic, magnetic, windowed and imbedded. The thread currently in use in U.S. currency is an embedded, microprinted thread which can be seen only when held to a light. This characteristic makes it impossible to copy with a color copier, which uses reflected light to generate an image.

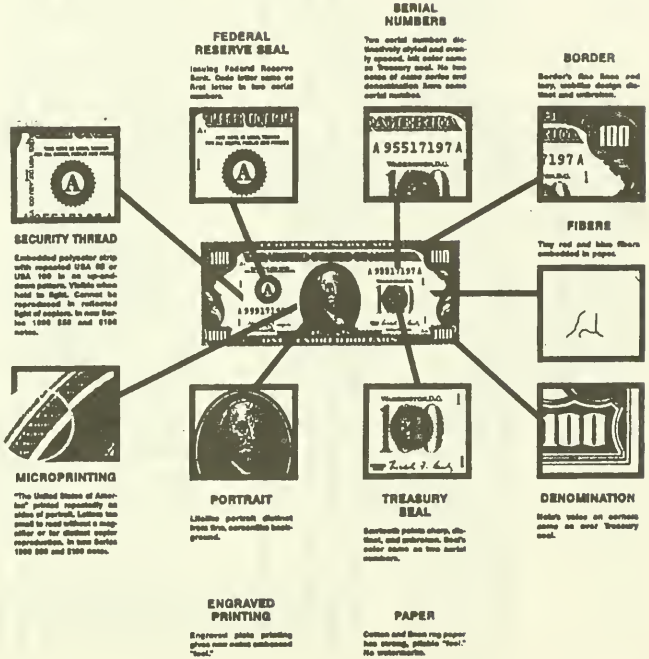
Watermark. A watermark is an image formed by purposely creating localized variations in the paper density during the papermaking process. The image is visible as darker and lighter areas when held against a light source. Like the embedded thread, it does not copy on color copiers.

Color-Shifting Inks. These inks change color when viewed from different angles. For instance, an ink that may appear gold when viewed directly may change to green when viewed obliquely.

Moiré-Generating Line Structures. These types of line structures appear normal to the human eye but cannot be properly resolved by current scanning equipment. This results in the creation of spurious images, or moiré patterns, in the digital output, producing a copy that is noticeably distinguishable from the original.

U.S. Department of Treasury
July 13, 1994

CURRENT SECURITY FEATURES



Counterfeiting Trends
Fiscal Years 1984 - 1993

Counterfeit Notes
(Figures in Dollars)

Fiscal Year	Passed on to Public	Seized before Circulation	Appearing Abroad	Total
1984	$7,559,392	$81,730,511	–	$89,289,903
1985	$6,925,758	$61,731,753	–	$68,657,511
1986	$6,870,335	$38,848,799	–	$45,719,134
1987	$9,322,348	$62,260,707	$18,192,077	$89,775,132
1988	$11,562,614	$110,076,015	$14,432,350	$136,070,979
1989	$13,841,983	$75,257,666	$88,172,251	$177,271,900
1990	$14,021,096	$66,337,675	$32,785,612	$113,144,383
1991	$17,142,926	$69,622,271	$30,752,009	$117,517,206
1992	$19,145,313	$60,731,139	$29,998,530	$109,874,982
1993	$19,601,697	$24,192,163	$120,767,004	$164,560,864
Total	$125,993,462	$650,788,699	$335,099,833	$1,111,881,994
Average	$12,599,346	$65,078,870	$47,871,405	$111,188,199

Counterfeit Notes
(Figures in Pieces)

Fiscal Year	Passed on to Public	Seized before Circulation	Appearing Abroad	Total
1984	207,030	2,086,661	–	2,293,691
1985	182,764	1,335,176	–	1,517,940
1986	200,898	748,550	–	949,448
1987	293,754	1,382,057	282,948	1,958,759
1988	283,884	2,310,769	235,086	2,829,739
1989	388,581	2,191,438	932,803	3,512,822
1990	369,737	1,642,632	535,876	2,548,245
1991	412,944	1,870,049	326,379	2,609,372
1992	467,242	1,841,612	596,405	2,905,259
1993	434,582	513,926	1,793,873	2,742,381
Total	3,241,416	15,922,870	4,703,370	23,867,656
Average	324,142	1,592,287	671,910	2,386,766

Average Denomination of Counterfeit Currency

Fiscal Year	Passed on to Public	Seized before Circulation	Appearing Abroad	Average of Total
1984	$36.51	$39.17	–	$38.93
1985	$37.89	$46.23	–	$45.23
1986	$34.20	$51.90	–	$48.15
1987	$31.74	$45.05	$64.29	$45.83
1988	$40.73	$47.64	$61.39	$48.09
1989	$35.62	$34.34	$94.52	$50.46
1990	$37.92	$40.38	$61.18	$44.40
1991	$41.51	$37.23	$94.22	$45.04
1992	$40.98	$32.98	$50.30	$37.82
1993	$45.10	$47.07	$67.32	$60.01
Average	$38.22	$42.20	$70.46	$46.40

* Appearing Abroad figures not available prior to FY 1987.

TOTAL CURRENCY IN CIRCULATION
(Millions of pieces)

Year	$1s	$5s	$10s	$20s	$50s	$100s	Total
1970	2,310	632	917	929	98	121	5,007
1971	2,408	655	935	995	108	134	5,234
1972	2,523	690	983	1,094	117	151	5,558
1973	2,639	723	1,023	1,196	130	173	5,883
1974	2,720	744	1,050	1,310	149	203	6,176
1975	2,809	768	1,078	1,417	163	231	6,467
1976	2,858	781	1,078	1,499	181	267	6,663
1977	3,038	838	1,136	1,662	202	308	7,184
1978	3,194	879	1,166	1,802	226	363	7,630
1979	3,308	910	1,189	1,931	252	420	8,009
1980	3,499	927	1,192	2,037	275	493	8,423
1981	3,612	959	1,182	2,126	298	538	8,716
1982	3,682	962	1,168	2,259	336	594	9,000
1983	3,628	987	1,189	2,468	386	675	9,333
1984	3,844	1,035	1,209	2,599	424	736	9,846
1985	3,814	1,064	1,192	2,763	469	812	10,114
1986	4,021	1,100	1,214	2,896	514	896	10,641
1987	4,399	1,128	1,239	3,066	565	1,004	11,401
1988	4,688	1,193	1,253	3,234	611	1,107	12,086
1989	4,944	1,225	1,249	3,356	635	1,187	12,597
1990	5,075	1,253	1,259	3,451	678	1,402	13,118
1991	5,283	1,289	1,263	3,502	712	1,572	13,621
1992	5,496	1,334	1,296	3,665	760	1,771	14,321
1993	5,754	1,371	1,318	3,748	826	2,018	15,035
AAGR/70	4.05%	3.42%	1.59%	6.25%	9.72%	13.02%	4.90%
AAGR/80	3.90%	3.06%	0.77%	4.80%	8.84%	11.46%	4.56%
AAGR/90	4.27%	3.04%	1.53%	2.79%	6.80%	12.91%	4.65%

TOTAL CURRENCY IN CIRCULATION
(Millions of dollars)

Year	$1s	$5s	$10s	$20s	$50s	$100s	Total
1970	$2,310	$3,161	$9,170	$18,581	$4,896	$12,084	$50,202
1971	$2,408	$3,273	$9,348	$19,893	$5,377	$13,414	$53,713
1972	$2,523	$3,449	$9,827	$21,883	$5,868	$15,118	$58,668
1973	$2,639	$3,614	$10,226	$23,915	$6,514	$17,288	$64,196
1974	$2,720	$3,718	$10,503	$26,198	$7,444	$20,298	$70,881
1975	$2,809	$3,841	$10,777	$28,344	$8,157	$23,139	$77,067
1976	$2,858	$3,905	$10,775	$29,987	$9,027	$26,668	$83,220
1977	$3,038	$4,190	$11,361	$33,233	$10,079	$30,818	$92,719
1978	$3,194	$4,393	$11,661	$36,045	$11,279	$36,306	$102,878
1979	$3,308	$4,549	$11,894	$38,613	$12,585	$41,960	$112,909
1980	$3,499	$4,635	$11,924	$40,738	$13,731	$49,264	$123,791
1981	$3,612	$4,797	$11,824	$42,520	$14,888	$53,807	$131,448
1982	$3,682	$4,810	$11,677	$45,180	$16,784	$59,392	$141,525
1983	$3,628	$4,936	$11,890	$49,355	$19,306	$67,505	$156,620
1984	$3,844	$5,173	$12,086	$51,987	$21,184	$73,567	$167,841
1985	$3,814	$5,320	$11,917	$55,269	$23,446	$81,186	$180,952
1986	$4,021	$5,500	$12,136	$57,928	$25,696	$89,561	$194,842
1987	$4,399	$5,642	$12,389	$61,318	$28,240	$100,374	$212,362
1988	$4,688	$5,964	$12,530	$64,681	$30,544	$110,677	$229,084
1989	$4,944	$6,127	$12,493	$67,116	$31,730	$118,740	$241,150
1990	$5,075	$6,267	$12,590	$69,019	$33,908	$140,175	$267,034
1991	$5,283	$6,445	$12,628	$70,033	$35,622	$157,244	$287,254
1992	$5,496	$6,670	$12,956	$73,294	$37,991	$177,111	$313,518
1993	$5,754	$6,856	$13,177	$74,969	$41,306	$201,785	$343,847
AAGR/70	4.05%	3.42%	1.59%	6.25%	9.72%	13.02%	8.73%
AAGR/80	3.90%	3.06%	0.77%	4.80%	8.84%	11.46%	8.18%
AAGR/90	4.27%	3.04%	1.53%	2.79%	6.80%	12.91%	8.79%

GROWTH RATES OF $100 AND $50 DENOMINATIONS
(Millions of dollars)

Year	Total Curr In Circ	Pctage Change	Absolute Change	$100 FRNs In Circ	Pctage Change	Absolute Change	Absolute Change: $1-$50s	$100s as Pct of Total
1980	$123,791			$49,264				39.80%
1981	$131,448	6.19%	$7,657	$53,807	9.22%	$4,543	$3,114	40.93%
1982	$141,525	7.67%	$10,077	$59,392	10.38%	$5,585	$4,492	41.97%
1983	$156,620	10.67%	$15,095	$67,505	13.66%	$8,113	$6,982	43.10%
1984	$167,841	7.16%	$11,221	$73,567	8.98%	$6,062	$5,159	43.83%
1985	$180,952	7.81%	$13,111	$81,186	10.36%	$7,619	$5,492	44.87%
1986	$194,842	7.68%	$13,890	$89,561	10.32%	$8,375	$5,515	45.97%
1987	$212,362	8.99%	$17,520	$100,374	12.07%	$10,813	$6,707	47.27%
1988	$229,084	7.87%	$16,722	$110,677	10.26%	$10,303	$6,419	48.31%
1989	$241,150	5.27%	$12,066	$118,741	7.29%	$8,064	$4,002	49.24%
1990	$267,034	10.73%	$25,884	$140,175	18.05%	$21,434	$4,450	52.49%
1991	$287,254	7.57%	$20,220	$157,244	12.18%	$17,069	$3,151	54.74%
1992	$313,518	9.14%	$26,264	$177,110	12.63%	$19,866	$6,398	56.49%
1993	$343,847	9.67%	$30,329	$201,785	13.93%	$24,675	$5,654	58.68%
AAGR		8.18%			11.46%			

Year	Total Curr In Circ	Pctage Change	Absolute Change	$50 FRNs In Circ	Pctage Change	Absolute Change	Absolute Change: $1-$20s	$50s + $100s as Pct of Total
1980	$123,791			$13,731				50.89%
1981	$131,448	6.19%	$7,657	$14,889	8.43%	$1,158	$1,956	52.26%
1982	$141,525	7.67%	$10,077	$16,785	12.73%	$1,896	$2,596	53.83%
1983	$156,620	10.67%	$15,095	$19,307	15.03%	$2,522	$4,460	55.43%
1984	$167,841	7.16%	$11,221	$21,184	9.72%	$1,877	$3,282	56.45%
1985	$180,952	7.81%	$13,111	$23,446	10.68%	$2,262	$3,230	57.82%
1986	$194,842	7.68%	$13,890	$25,696	9.60%	$2,250	$3,265	59.15%
1987	$212,362	8.99%	$17,520	$28,240	9.90%	$2,544	$4,163	60.56%
1988	$229,084	7.87%	$16,722	$30,544	8.16%	$2,304	$4,115	61.65%
1989	$241,150	5.27%	$12,066	$31,730	3.88%	$1,186	$2,816	62.40%
1990	$267,034	10.73%	$25,884	$33,908	6.86%	$2,178	$2,272	65.19%
1991	$287,254	7.57%	$20,220	$35,622	5.05%	$1,714	$1,437	67.14%
1992	$313,518	9.14%	$26,264	$37,991	6.65%	$2,369	$4,029	68.61%
1993	$343,847	9.67%	$30,329	$41,306	8.73%	$3,315	$2,339	70.70%
AAGR		8.18%			8.84%			

CURRENCY ESTIMATED TO BE HELD OUTSIDE THE UNITED STATES*
December 31, 1993

Denom.	Total in Circulation (Millions of Pieces)	Total in Circulation (Millions of Dollars)	Estimated Outside U.S. %	Estimated Outside U.S. (Millions of Pieces)	Estimated Outside U.S. (Millions of Dollars)
$1	5,754	$5,754	40%	2,302	$2,302
$5	1,371	$6,856	55%	754	$3,771
$10	1,318	$13,177	55%	725	$7,247
$20	3,748	$74,969	65%	2,436	$48,730
$50	826	$41,306	50%	413	$20,653
$100	2,018	$201,785	65%	1,312	$131,160
Total	15,035	$343,847		7,942	$213,863
				53%	62%

* Based on estimates by staff of the Board of Governors for 1992 data.

CONTRIBUTION OF CURRENCY HELD OUTSIDE THE UNITED STATES TO THE EARNINGS OF THE FEDERAL RESERVE SYSTEM AND TO THE NET FRS EARNINGS PAID TO THE TREASURY

Federal Reserve System
Balance Sheet (in billions) @ 12/31/93

U.S. Govt securities	$344	DFI deposits	$ 42
Other (nonearning) assets	65	Other deposits	6
		Federal Reserve notes	346
		Other liabilities	8
		Capital accounts	7
Total assets	$409	Total liab & capital	$409

Federal Reserve System
Income Statement (in millions) for 1993

Operating income		
Interest on loans		$ 6
Interest on U.S. Govt securities		16,891
Interest on foreign securities		1,249
Receipts from priced services		756
Other		11
Total operating income		$18,913
Operating expenses		
Operating expenses of FR Banks	1,609	
Periodic pension cost adjustment	(131)	
Earnings credits to DFIs	182	
Total operating expenses		1,660
Current net income		$17,254
Net additions to (and deductions from) CNI		(201)
Cost of unreimbursed Treasury services		(28)
Assessment for Board of Governors expenditures		(140)
Assessment for cost of new currency		(356)
Net income		$16,528
Dividends paid		195
Payments to U.S. Treasury		15,985
Transferred to Surplus		$ 348

The average yield on the Federal Reserve's holdings of U.S. Government securities in 1993 was 5.27%.

Assuming $213 billion (62%) of Federal Reserve notes are outside the United States, corresponding FR assets of $213 billion, at a yield of 5.27%, contributed $11.2 billion to FR interest income.

As the FR notes outside the U.S. contributed only negligibly to FR expenses, they also accounted for $11.2 billion of the FR's net income and payments to the Treasury.

Any reduction in foreign holdings of FR notes would result in an annual loss to the Treasury of (approximately) the reduction times the yield on the Federal Reserve's portfolio.

On the basis of 1993 values, a ten-percent decline in foreign holdings would result in a loss to the Treasury of over $1 billion per year for as long as the reduction in foreign holdings persisted.

All Data in thousands of pieces.

SYSTEM STATUS OF THE 1990 SERIES $50 NOTE

MONTH	NET NOTES PUT IN CIRCULATION	CUMULATIVE NOTES IN CIRCULATION	TOTAL NOTES IN CIRCULATION	PERCENT OF NOTES IN CIRCULATION
MARCH 92	27,977	27,977	698,573	4.0%
APRIL 92	45,527	73,504	705,319	10.4%
MAY 92	39,237	112,741	718,925	15.7%
JUNE 92	30,239	142,980	715,809	20.0%
JULY 92	31,416	174,396	722,327	24.1%
AUGUST 92	14,817	189,213	724,770	26.1%
SEPTEMBER 92	22,314	211,527	721,613	29.3%
OCTOBER 92	20,959	232,486	734,656	31.6%
NOVEMBER 92	24,941	257,427	741,752	34.7%
DECEMBER 92	34,054	291,481	759,823	38.4%
JANUARY 93 *	(13,646)	277,835	714,447	38.9%
FEBRUARY 93 *	15,254	293,089	726,277	40.4%
MARCH 93	11,924	305,013	753,229	40.5%
APRIL 93	12,219	317,232	758,243	41.8%
MAY 93	16,872	334,104	771,083	43.3%
JUNE 93	16,170	350,274	774,256	45.2%
JULY 93	15,867	366,141	777,124	47.1%
AUGUST 93	5,309	371,450	777,532	47.8%
SEPTEMBER 93	9,083	380,533	777,457	48.9%
OCTOBER 93 *	16,017	396,550	786,330	50.4%
NOVEMBER 93 *	24,814	421,364	807,246	52.2%
DECEMBER 93 *	30,444	451,808	826,124	54.7%

RESERVE BANKS HAVE 2 MONTHS OF $50 NOTES AVAILABLE FOR PAYMENTS. THE BEP HAS LESS THAN 1 MONTH OF INVENTORY AVAILABLE.

FRB INVENTORY 172 MILLION PIECES
BEP INVENTORY 78 MILLION PIECES

* TOTAL NOTES IN CIRCULATION HAS BEEN ESTIMATED.

All Data in thousands of pieces.

SYSTEM STATUS OF THE 1990 SERIES $100 NOTE

MONTH	NET NOTES PUT IN CIRCULATION	CUMULATIVE NOTES IN CIRCULATION	TOTAL NOTES IN CIRCULATION	PERCENT OF NOTES IN CIRCULATION
AUGUST 91	22,133	22,133	1,503,336	1.5%
SEPTEMBER 91	40,238	62,371	1,505,663	4.1%
OCTOBER 91	47,929	110,300	1,522,138	7.2%
NOVEMBER 91	43,600	153,900	1,540,439	10.0%
DECEMBER 91	64,987	218,887	1,572,445	13.9%
JANUARY 92	18,271	237,158	1,562,593	15.2%
FEBRUARY 92	30,657	267,815	1,570,360	17.1%
MARCH 92	33,353	301,168	1,580,612	19.1%
APRIL 92	37,525	338,693	1,598,332	21.2%
MAY 92	31,422	370,115	1,616,359	22.9%
JUNE 92	31,807	401,922	1,625,669	24.7%
JULY 92	47,346	449,268	1,655,089	27.1%
AUGUST 92	33,343	482,611	1,674,363	28.8%
SEPTEMBER 92	33,991	516,602	1,687,129	30.6%
OCTOBER 92	24,412	541,014	1,700,593	31.8%
NOVEMBER 92	43,112	584,126	1,731,345	33.7%
DECEMBER 92	57,627	641,753	1,771,109	36.2%
JANUARY 93 *	4,597	646,350	1,749,711	36.9%
FEBRUARY 93 *	25,265	671,615	1,769,676	38.0%
MARCH 93	33,208	704,823	1,799,321	39.2%
APRIL 93	33,439	738,262	1,825,083	40.5%
MAY 93	32,267	770,529	1,849,839	41.7%
JUNE 93	38,244	808,773	1,878,090	43.1%
JULY 93	37,969	846,742	1,899,407	44.6%
AUGUST 93	40,172	886,914	1,926,426	46.0%
SEPTEMBER 93	29,389	916,303	1,946,963	47.1%
OCTOBER 93 *	20,746	937,049	1,955,452	47.9%
NOVEMBER 93 *	33,485	970,534	1,982,320	49.0%
DECEMBER 93 *	47,547	1,018,081	2,017,861	50.5%

RESERVE BANKS HAVE 1.5 MONTHS OF $100 NOTES AVAILABLE FOR PAYMENTS. THE BEP HAS LESS THAN 1 MONTH INVENTORY AVAILABLE.

FRB INVENTORY 151 MILLION PIECES
BEP INVENTORY 25 MILLION PIECES

* TOTAL NOTES IN CIRCULATION HAS BEEN ESTIMATED.

INCREASES IN $100 NOTES IN CIRCULATION 8/91 TO 12/93	514,525
PRE-1990 SERIES NOTES RETIRED	503,556
PERCENT OF PRE-1990 SERIES NOTES RETIRED FROM CIRCULATION	33.5%

PERCENT OF NEW NOTES IN RECEIPTS
92/93 MONTHLY DATA
$50 NOTES

DISTRICT	1992 JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	1993 JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
BOSTON			0.0%	14.4%	31.4%	43.6%	52.1%	56.6%	61.4%	65.2%	43.7%	68.0%	64.5%	73.1%	75.3%	78.0%	78.5%	83.2%	81.6%	68.4%	82.6%	83.1%	69.0%	57.3%
NEW YORK			0.0%	13.5%	27.1%	33.8%	47.4%	52.7%	47.6%	57.5%	66.0%	69.3%	65.4%	63.1%	66.9%	54.3%	56.3%	62.3%	56.4%	63.3%	69.3%	64.1%	66.8%	67.6%
PHILADELPHIA			0.0%	24.4%	36.8%	55.4%	57.9%	59.0%	66.2%	69.1%	73.1%	75.4%	73.1%	79.6%	82.0%	80.8%	82.0%	83.3%	81.9%	85.3%	85.2%	84.1%	76.8%	83.8%
CLEVELAND			0.0%	6.1%	17.5%	38.8%	31.1%	51.5%	52.8%	61.2%	65.8%	72.6%	67.2%	56.6%	75.0%	74.7%	74.3%	81.3%	81.7%	82.0%	76.5%	75.0%	76.8%	59.6%
RICHMOND			0.0%	11.4%	35.5%	51.2%	64.4%	69.3%	70.8%	66.3%	78.7%	77.5%	84.7%	83.4%	87.3%	79.2%	84.9%	88.5%	88.5%	89.2%	89.3%	90.4%	78.0%	91.2%
ATLANTA			0.0%	6.8%	19.2%	33.5%	41.8%	50.2%	54.7%	61.2%	64.1%	66.6%	72.3%	70.0%	70.6%	74.7%	75.2%	74.5%	76.8%	78.5%	74.5%	69.7%	76.3%	74.2%
CHICAGO			0.0%	12.9%	34.6%	51.9%	60.7%	65.2%	66.6%	71.7%	77.4%	78.2%	81.4%	74.1%	80.1%	87.9%	87.9%	85.3%	88.5%	81.3%	87.3%	90.8%	90.2%	91.5%
ST. LOUIS			0.0%	11.5%	27.3%	43.6%	46.1%	61.8%	63.2%	68.5%	75.7%	58.2%	80.7%	82.1%	83.2%	83.1%	85.0%	86.6%	86.1%	86.5%	87.9%	87.3%	87.4%	90.1%
MINNEAPOLIS			0.0%	11.7%	33.5%	43.2%	55.1%	61.6%	67.2%	69.7%	74.6%	75.3%	81.1%	73.0%	73.4%	84.4%	80.8%	85.6%	86.4%	86.8%	89.5%	87.3%	88.2%	89.2%
KANSAS CITY			0.0%	36.8%	20.5%	44.9%	50.9%	57.6%	62.5%	69.5%	71.8%	72.0%	78.1%	80.1%	77.2%	78.6%	81.2%	85.1%	82.5%	69.3%	73.7%	82.0%	85.8%	85.6%
DALLAS			0.0%	4.0%	21.9%	34.7%	49.1%	57.7%	63.1%	69.2%	73.6%	76.5%	80.8%	82.7%	84.0%	84.6%	81.7%	80.4%	82.6%	84.1%	80.0%	87.2%	87.6%	88.7%
SAN FRANCISCO			0.0%	3.8%	18.6%	33.9%	30.7%	65.9%	68.8%	75.3%	70.4%	71.2%	80.7%	80.1%	83.6%	84.8%	83.2%	86.4%	87.1%	87.6%	87.5%	90.3%	88.8%	86.1%
SYSTEM AVG.			0.0%	9.7%	24.8%	39.5%	46.2%	60.1%	62.4%	67.9%	70.3%	72.1%	75.9%	74.4%	78.3%	78.2%	78.9%	80.8%	81.2%	80.4%	82.4%	81.6%	81.2%	81.2%

PERCENT OF NEW NOTES IN RECEIPTS
92/93 MONTHLY DATA
$100 NOTES

DISTRICT	1992 JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	1993 JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
BOSTON	40.3%	34.4%	39.2%	48.2%	54.2%	55.1%	61.2%	62.2%	64.0%	61.9%	69.5%	70.0%	70.0%	72.3%	73.6%	64.6%	73.0%	69.2%	74.6%	68.2%	69.3%	76.0%	77.7%	74.4%
NEW YORK (1)	32.0%	48.7%	41.6%	31.3%	38.0%	37.6%	43.1%	49.6%	43.6%	52.9%	59.8%	69.4%	69.5%	68.5%	74.4%	61.8%	75.0%	71.8%	78.1%	77.6%	73.4%	72.6%	68.6%	74.9%
PHILADELPHIA	36.1%	50.8%	53.2%	55.1%	53.9%	70.3%	64.7%	56.8%	58.1%	60.1%	65.5%	65.9%	70.6%	68.9%	70.3%	68.4%	73.9%	72.3%	73.7%	73.7%	74.7%	73.3%	70.2%	76.2%
CLEVELAND	35.9%	60.4%	52.2%	36.7%	51.6%	54.4%	65.1%	56.7%	57.1%	60.2%	62.5%	48.9%	68.4%	60.6%	63.4%	68.1%	72.6%	74.8%	67.5%	68.8%	70.6%	72.9%	73.1%	65.8%
RICHMOND	51.7%	41.8%	60.9%	62.0%	66.5%	69.4%	73.9%	73.6%	71.6%	69.3%	77.4%	78.4%	81.5%	74.8%	82.3%	73.1%	84.4%	83.5%	84.1%	84.1%	84.2%	84.9%	86.0%	87.0%
ATLANTA	36.1%	43.1%	37.1%	39.6%	43.0%	48.4%	49.6%	51.9%	55.1%	57.4%	67.2%	60.9%	67.2%	65.8%	65.8%	63.9%	65.2%	67.8%	69.7%	67.4%	70.7%	66.2%	66.5%	70.5%
CHICAGO	42.4%	40.3%	23.3%	45.3%	60.6%	56.4%	74.2%	65.1%	67.6%	67.9%	66.8%	73.1%	72.6%	69.3%	74.7%	76.5%	74.7%	80.8%	82.0%	76.8%	82.3%	81.2%	81.1%	81.8%
ST. LOUIS	47.3%	35.6%	58.5%	51.5%	63.5%	63.6%	62.1%	67.1%	64.3%	71.3%	75.2%	73.0%	78.4%	77.7%	78.6%	76.3%	79.1%	80.6%	82.0%	76.6%	82.4%	82.6%	83.1%	84.0%
MINNEAPOLIS	46.0%	35.7%	47.8%	47.9%	59.1%	55.6%	61.9%	63.7%	66.8%	66.0%	70.3%	70.0%	75.5%	67.1%	65.3%	77.1%	75.5%	76.9%	78.9%	78.9%	79.8%	80.2%	80.6%	84.6%
KANSAS CITY	43.3%	45.9%	51.2%	64.7%	51.8%	60.1%	62.9%	61.3%	65.7%	69.5%	67.0%	60.0%	74.1%	75.5%	71.9%	71.4%	76.2%	78.0%	77.8%	70.0%	73.8%	74.9%	81.6%	77.7%
DALLAS	37.1%	42.8%	42.1%	40.5%	48.0%	51.8%	59.3%	61.2%	65.2%	68.7%	70.5%	70.5%	76.4%	78.3%	77.0%	79.2%	72.1%	73.8%	74.6%	76.1%	80.8%	80.5%	80.7%	80.0%
SAN FRANCISCO	29.0%	36.7%	41.8%	47.6%	55.5%	60.6%	62.7%	65.6%	64.7%	68.0%	63.6%	65.9%	80.2%	75.4%	75.9%	76.5%	78.7%	78.9%	80.1%	79.5%	81.5%	79.7%	84.1%	91.0%
SYSTEM AVG.	36.4%	42.2%	42.4%	44.8%	51.6%	54.3%	59.8%	60.9%	60.4%	64.1%	66.1%	67.1%	75.0%	72.6%	73.9%	72.4%	75.7%	76.2%	77.4%	76.2%	78.1%	75.7%	79.2%	82.6%

(1) New York data has been adjusted to exclude foreign deposits.

13-Jan-94

Table 1

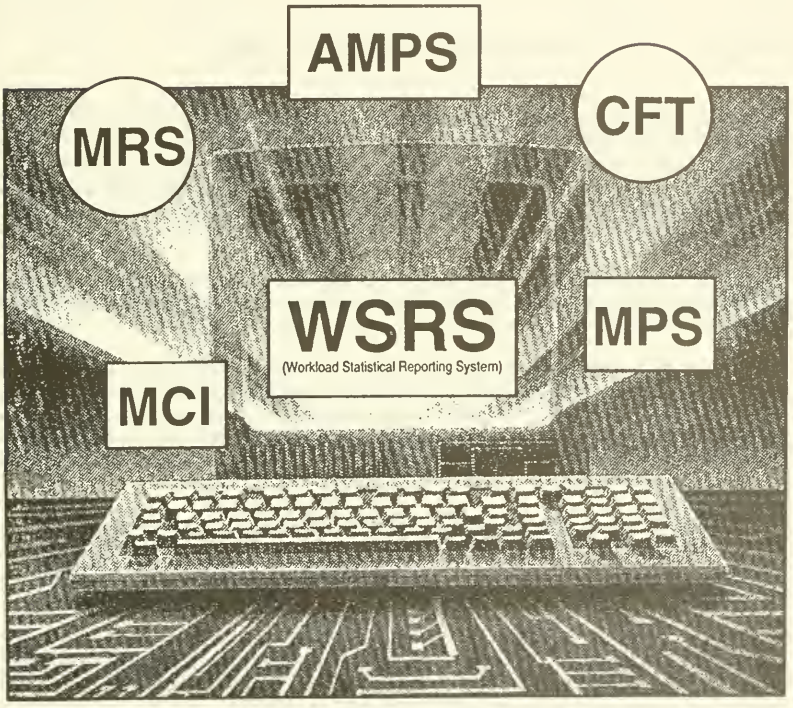
Federal Reserve Notes
In Circulation and Counterfeited
Counterfeit Notes PASSED

Note: 1993 circulation data and 1993 aggregate c/f data are annualized from data for 9/30/93.

	1970	1975	1980	1985	1990	1991	1992	1993
$1 notes								
In circ (mill.)	$2,310	$2,809	$3,499	$3,814	$5,075	$5,283	$5,496	$5,754
C/f'd (thou.)	$1	$2	$18	$22	$9	$9	$8	$6
C/f'd per mill.	0.4	0.7	5.1	5.8	1.9	1.6	1.4	1.1
C/fs found by FRS (thou.)				$0	$1	$1	$1	$1
% found by FRS				1%	8%	14%	17%	24%
$5 notes								
In circ (mill.)	$3,161	$3,841	$4,635	$5,320	$6,267	$6,445	$6,670	$6,856
C/f'd (thou.)	$44	$19	$45	$20	$33	$70	$97	$134
C/f'd per mill.	13.9	4.9	9.7	3.8	5.3	10.9	14.5	19.5
C/fs found by FRS (thou.)				$4	$4	$6	$12	$11
% found by FRS				19%	13%	8%	12%	8%
$10 notes								
In circ (mill.)	$9,170	$10,777	$11,924	$11,917	$12,590	$12,628	$12,956	$13,177
C/f'd (thou.)	$650	$549	$465	$141	$473	$326	$358	$223
C/f'd per mill.	70.9	50.9	39.0	11.8	37.6	25.8	27.7	17.0
C/fs found by FRS (thou.)				$39	$165	$105	$78	$122
% found by FRS				27%	35%	32%	22%	54%
$20 notes								
In circ (mill.)	$18,581	$28,344	$40,738	$55,269	$69,019	$70,033	$73,294	$74,969
C/f'd (thou.)	$1,144	$1,498	$3,150	$1,567	$3,424	$4,767	$4,933	$3,976
C/f'd per mill.	61.6	52.9	77.3	28.4	49.6	68.1	67.3	53.0
C/fs found by FRS (thou.)				$410	$807	$1,047	$891	$935
% found by FRS				26%	24%	22%	18%	24%
$50 notes								
In circ (mill.)	$4,896	$8,157	$13,731	$23,446	$33,908	$35,622	$37,991	$41,306
C/f'd (thou.)	$84	$466	$1,372	$762	$1,123	$1,320	$1,653	$1,578
C/f'd per mill.	17.2	57.1	99.9	32.5	33.1	37.1	43.5	38.2
C/fs found by FRS (thou.)				$129	$196	$195	$230	$272
% found by FRS				17%	17%	15%	14%	17%
$100 notes								
In circ (mill.)	$12,084	$23,139	$49,264	$81,186	$140,175	$157,244	$177,111	$201,785
C/f'd (thou.)	$240	$1,073	$3,776	$3,971	$9,235	$11,564	$12,364	$13,560
C/f'd per mill.	19.9	46.4	76.6	48.9	65.9	73.5	69.8	67.2
C/fs found by FRS (thou.)				$671	$2,014	$3,231	$3,106	$3,999
% found by FRS				17%	22%	28%	25%	29%
All denominations								
In circ (mill.)	$50,202	$77,067	$123,791	$180,952	$267,034	$287,255	$313,518	$343,847
C/f'd (thou.)	$2,163	$3,607	$8,826	$6,483	$14,297	$18,056	$19,413	$19,478
C/f'd per mill.	43.1	46.8	71.3	35.8	53.5	62.9	61.9	56.6
C/fs found by FRS (thou.)				$1,253	$3,187	$4,585	$4,318	$5,340
% found by FRS				19%	22%	25%	22%	27%

Annual Statistical Summary FY93

Department of the Treasury
United States Secret Service



DEPARTMENT OF THE TREASURY
UNITED STATES SECRET SERVICE
WASHINGTON, D.C. 20223

DIRECTOR

January 11, 1994

MEMORANDUM

TO : All Supervisory Personnel 115.000

FROM : Director

SUBJECT : Annual Statistical Summary for Fiscal Year 1993

Fiscal Year 1993 was an extremely productive year for the U.S. Secret Service. With the conclusion of the 1992 Presidential Campaign, the Secret Service was able to redirect more of its field resources into the investigative area. This shift resulted in a 10 percent increase in the number of cases closed and a 15 percent increase in the number of arrests over the previous fiscal year. Investigative activity increased in the counterfeiting, forgery and financial crime/fraud areas.

The Secret Service received a total of 95,602 cases during Fiscal Year 1993. A total of 94,792 cases were closed, and 7,490 arrests were reported. The conviction rate of arrests that went to trial was 99.5 percent.

The number of financial crime/fraud cases received increased by 39 percent. With 7,160 cases received, financial crime/fraud continues to be a productive area. During Fiscal Year 1993, a total of 6,350 cases were closed, and 3,259 arrests were reported. Access device and direct deposit cases represent the majority of cases in this category, accounting for 76 percent of all financial crime/fraud cases received. Financial crime and fraud arrests increased 18 percent, and accounted for 44 percent of all Secret Service arrests.

Counterfeiting of U.S. currency in foreign countries increased enormously in Fiscal Year 1993. The Secret Service focus in this area has resulted in the reporting of foreign originated notes valued at $120,767,004. A total of 162 counterfeit plant operations were suppressed, representing an increase of 18 percent over Fiscal Year 1992.

Forgery referrals increased 11 percent from 44,683 in Fiscal Year 1992 to 49,614 in Fiscal Year 1993. The Secret Service continues to efficiently process forgery cases by administratively closing those cases without investigative or prosecutorial merit. During Fiscal Year 1993, 78 percent of all forgery cases were administratively closed. Agents of the Secret Service reported 1,578 arrests for forgery offenses.

I am pleased with the annual statistics of the Secret Service for Fiscal Year 1993. As a result of the expertise, dedication and effort of the entire Secret Service work force, we were able to fulfill both our protective and investigative responsibilities in a highly successful manner. I commend each member of our organization.

The information in this summary should be discussed with the personnel of your office. Special Agents in Charge may make public the statistics which pertain to the entire Secret Service effort, as detailed above, as well as those statistics which apply to their districts. Statistics which relate to other districts should not be released.

Elmer Bowron

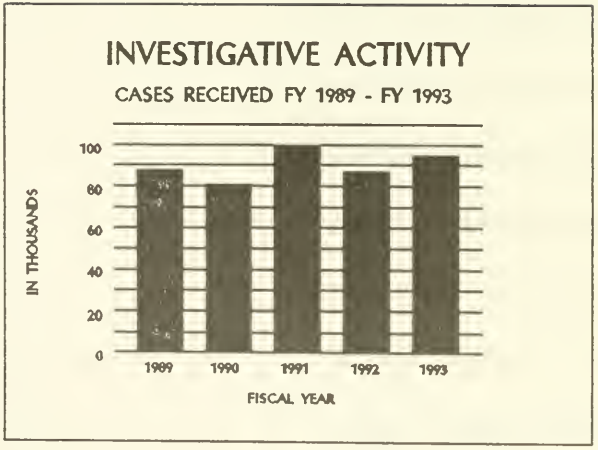
Attachment

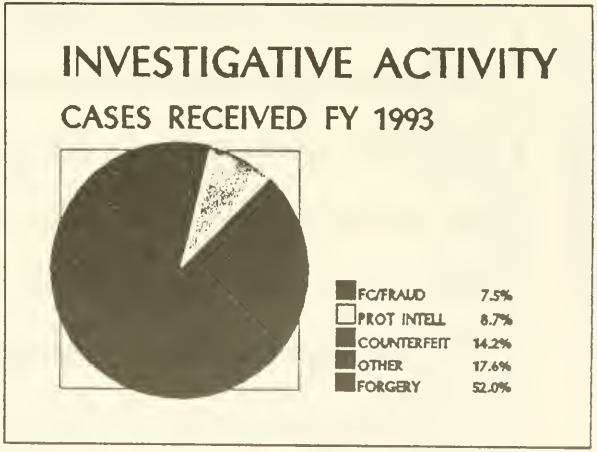
UNITED STATES SECRET SERVICE
INVESTIGATIVE ACTIVITY
PENDING, RECEIVED AND CLOSED
FISCAL YEARS 1989–1993

	INVESTIGATIVE ACTIVITY	FY 1989 CASES	FY 1989 UNITS	FY 1990 CASES	FY 1990 UNITS	FY 1991 CASES	FY 1991 UNITS	FY 1992 CASES	FY 1992 UNITS	FY 1993 CASES	FY 1993 UNITS	FY 1994 CASES	FY 1994 UNITS
PENDING BEGINNING OF THE FISCAL YEAR	Counterfeiting	3,543	4,098	2,657	2,818	2,517	2,554	2,978	3,122	3,164	3,199	3,006	3,838
	Check Forgery	24,199	51,674	12,892	26,164	9,822	17,436	9,377	15,229	8,694	14,687	8,136	13,120
	Bond Forgery	197	4,263	106	2,924	120	3,563	113	2,729	83	2,647	56	1,836
	*Financial Crime/Fraud	3,665	14,322	3,608	11,266	3,743	8,426	3,656	7,489	4,047	6,842	4,724	6,782
	Protective Intelligence	1,656	1,685	723	723	739	739	550	550	737	737	722	722
	Criminal (Other & Non)	5,643	19,656	3,876	9,249	5,076	9,448	3,016	6,605	3,415	6,787	3,044	5,529
	TOTAL	39,105	95,900	23,862	55,142	22,017	42,168	19,690	35,724	20,160	36,899	19,690	31,407
RECEIVED	Counterfeiting	15,006	15,348	12,750	12,812	12,662	13,005	12,231	12,309	13,561	14,213		
	Check Forgery	41,217	62,216	38,181	47,010	61,088	70,866	44,683	52,320	49,614	56,870		
	Bond Forgery	181	3,292	153	3,812	181	3,030	118	3,404	109	1,970		
	*Financial Crime/Fraud	8,441	14,450	5,736	8,253	5,398	8,488	5,153	6,641	7,160	8,978		
	Protective Intelligence	7,591	7,894	7,179	7,180	6,618	6,618	8,353	8,357	8,284	8,316		
	Criminal (Other & Non)	16,544	37,983	17,503	25,550	14,766	21,384	16,803	25,592	16,674	24,119		
	TOTAL	88,980	141,184	81,504	104,617	100,715	123,392	87,341	106,823	95,602	114,466		
TOTAL FOR INVESTIGATION		128,085	237,084	105,366	159,759	122,732	165,560	107,031	144,547	115,762	151,365		
CLOSED	Counterfeiting	14,403	14,713	12,866	13,050	12,218	12,451	11,821	11,919	13,499	13,535		
	Check Forgery	42,662	66,185	41,110	57,731	60,961	74,329	45,031	54,845	49,631	59,617		
	Bond Forgery	178	2,900	139	3,173	159	3,750	148	3,805	131	3,258		
	*Financial Crime/Fraud	5,818	15,192	5,561	11,240	5,370	10,038	5,136	8,441	6,350	9,873		
	Protective Intelligence	7,640	7,949	7,161	7,182	6,744	6,744	8,103	8,107	8,213	8,221		
	Criminal (Other & Non)	18,563	42,967	16,173	25,316	14,450	22,248	15,910	26,642	16,768	24,634		
	TOTAL	89,484	151,926	83,030	117,672	99,902	129,560	86,147	113,559	94,792	119,138		
PERCENT CHANGE OVER PREVIOUS FISCAL YEAR													
	TOTAL PENDING	−0.5%	−2.3%	−39.0%	−42.5%	−7.7%	−23.5%	−10.6%	−16.3%	2.4%	3.3%	−2.3%	−14.9%
	TOTAL RECEIVED	−11.1%	−20.0%	−8.4%	−25.9%	23.6%	17.9%	−13.3%	−11.8%	9.5%	5.2%		
	TOTAL FOR INVESTIGATION	−8.1%	−13.7%	−17.7%	−32.8%	16.5%	3.6%	−12.8%	−12.7%	8.2%	4.7%		
	TOTAL CLOSED	−0.5%	−12.5%	−7.2%	−22.5%	20.3%	10.1%	−13.8%	−12.4%	10.0%	4.9%		

*Beginning in FY 1992, Financial Crime cases are counted together with the Fraud cases in the Financial Crime/Fraud category. Prior to FY 1992 Financial Crime cases were counted under Other Criminal.

**Statistics include Field Offices, Resident Offices, Resident Agencies, and Protective Divisions.


INVESTIGATIVE ACTIVITY
CASES RECEIVED FY 1989 - FY 1993
IN THOUSANDS
100
80
60
40
20
0
1989
1990
1991
1992
1993
FISCAL YEAR


INVESTIGATIVE ACTIVITY
CASES RECEIVED FY 1993
FC/FRAUD 7.5%
PROT INTELL 8.7%
COUNTERFEIT 14.2%
OTHER 17.6%
FORGERY 52.0%

FIELD OFFICE INVESTIGATIVE ACTIVITY
FISCAL YEAR 1993

OFFICE	Total Cases Pending Beginning FY 1993	CASES RECEIVED – FY 1993								Total Cases Closed FY 1993	Total Cases Pending End of FY 1993
		Counterfeiting	Check Forgery	Bond Forgery	Prot. Intell.	Fin. Crime/ Fraud	Prot. Survey	All Other	Total Received		
Atlanta	434	223	1,216	–	263	163	213	194	2,292	2,263	448
*Savannah	229	15	303	–	31	11	16	68	445	476	184
*Albany (GA)	78	14	189	–	56	10	48	36	353	331	91
Baltimore	265	144	852	4	166	107	64	1,125	2,462	2,350	360
Birmingham	176	45	516	–	39	54	16	90	760	750	177
+Mobile	157	75	242	–	32	38	8	57	452	432	161
*Montgomery	106	16	292	–	22	25	4	26	385	403	88
Boston	334	400	886	–	89	110	47	160	1,702	1,884	302
+Providence	95	179	247	1	19	23	1	35	505	618	77
*Portland (ME)	77	19	72	–	73	20	54	26	264	250	89
*Concord	52	27	42	–	17	22	4	17	129	138	38
Buffalo	176	94	152	–	27	52	13	58	396	440	128
+Syracuse	216	64	110	1	24	38	–	64	351	359	211
*Rochester	93	61	142	–	11	23	1	39	277	306	61
+Albany (NY)	75	86	156	–	31	17	–	93	385	386	73
Charlotte	295	223	709	2	85	116	45	143	1,323	1,321	316
+Raleigh	122	42	309	–	206	38	26	53	676	667	92
*Wilmington (NC)	72	56	156	–	22	16	3	54	309	336	65
Chicago	1,116	460	1,821	12	137	326	47	289	2,894	2,952	1,017
+Milwaukee	96	80	226	1	53	44	24	59	487	446	108
+Springfield (IL)	87	64	214	2	64	21	6	58	432	453	70
+Madison	30	13	67	2	60	7	14	17	180	161	41
Cincinnati	77	61	190	0	31	79	16	66	443	438	85
+Columbus	97	105	248	2	39	58	15	48	511	514	87
*Dayton	42	15	150	–	19	20	6	26	236	236	41
Cleveland	238	175	553	4	52	111	24	101	1,020	963	290
*Canton	50	40	89	–	24	21	9	25	208	217	39
*Toledo	60	34	141	2	23	33	10	33	276	271	63
Columbia	164	62	357	–	19	89	6	54	607	641	144
*Charleston (SC)	69	32	136	1	8	23	5	30	238	265	41
*Greenville	116	41	235	–	8	43	4	23	354	358	112
Dallas	490	503	846	–	221	145	112	175	2,002	1,968	455
*Lubbock	51	42	146	–	43	25	9	85	330	338	44
*Tyler	141	62	154	–	36	24	24	26	326	379	75
Denver	118	65	196	–	141	37	77	90	606	633	91
+Salt Lake City	111	117	94	–	16	51	11	44	335	368	78
*Cheyenne	19	8	34	–	19	4	9	19	93	92	17
+Boise	48	11	47	–	6	9	4	35	115	104	46
*Colorado Springs	13	14	38	–	23	4	7	23	109	113	12
Detroit	751	216	802	7	104	154	36	329	1,652	1,656	710
+Grand Rapids	95	37	167	–	59	31	21	71	386	368	94
+Saginaw	86	35	110	–	21	31	6	20	223	195	109
Honolulu	329	74	77	1	42	75	26	89	386	353	358
+Bangkok	41	48	–	–	4	15	–	3	71	82	29
+Manila	27	65	612	–	2	5	–	4	688	673	38
Houston	277	256	563	2	139	152	86	133	1,333	1,293	303
+Austin	127	143	213	1	57	50	29	75	570	532	152
Indianapolis	177	76	321	–	61	86	14	76	634	578	218
Jackson	143	24	559	–	28	89	9	51	738	721	153
Jacksonville	156	116	343	–	71	99	18	61	730	725	157
+Orlando	128	100	196	–	70	83	41	43	516	514	103
Kansas City	111	63	171	–	56	83	14	109	496	474	133
+Omaha	63	67	100	–	35	42	5	72	351	355	61
*Wichita	64	26	90	–	13	50	–	41	222	220	82
+Des Moines	85	44	101	–	29	16	6	33	233	234	40
*Springfield (MO)	46	9	62	–	83	16	3	27	202	195	51
Little Rock	243	76	561	–	139	100	74	76	1,028	1,054	204
Los Angeles	848	407	3,346	7	399	444	221	493	7,317	7,355	705
+Riverside	80	62	573	2	125	48	17	37	864	844	101
+Santa Ana	96	92	585	1	40	74	8	58	859	867	88
+Las Vegas	103	92	276	2	24	91	3	86	576	533	144
*Ventura	64	27	255	–	92	23	54	32	483	448	100
Louisville	122	48	252	1	33	61	12	35	440	425	128
*Lexington	63	20	131	–	29	16	10	20	226	226	57

FIELD OFFICE INVESTIGATIVE ACTIVITY
FISCAL YEAR 1993

OFFICE	Total Cases Pending Beginning FY 1993	CASES RECEIVED – FY 1993								Total Cases Closed FY 1993	Total Cases Pending End of FY 1993
		Counterfeiting	Check Forgery	Bond Forgery	Prot. Intell.	Fin. Crime/ Fraud	Prot. Survey	All Other	Total Received		
Memphis	138	60	383	–	39	58	10	36	586	607	117
Miami	655	649	1,441	–	154	177	112	186	2,719	2,790	692
+West Palm Beach	44	30	159	–	44	33	22	34	322	322	43
Minneapolis	165	59	196	1	92	33	31	82	496	315	137
*Bismarck	22	3	18	1	18	14	13	15	80	78	26
*Sioux Falls	14	18	40	–	9	23	7	13	110	98	26
Nashville	104	67	237	–	56	39	28	52	479	473	94
*Chattanooga	34	20	96	–	10	30	4	19	179	171	43
*Knoxville	65	11	198	–	17	13	7	39	285	284	52
New Orleans	133	56	703	1	42	64	18	45	927	928	108
*Shreveport	25	23	184	–	14	10	5	29	275	275	25
*Baton Rouge	30	76	140	1	21	15	17	15	288	284	31
New York	1,545	649	5,274	5	402	405	247	256	7,238	7,154	1,557
+White Plains	115	90	234	1	69	56	32	47	541	511	136
+Melville	115	114	150	–	27	75	1	51	418	431	105
+New Haven	156	77	407	4	58	85	25	117	771	788	143
Newark	649	474	1,814	2	178	155	99	122	2,842	2,727	732
*Trenton	39	112	43	–	9	8	2	16	190	188	39
Oklahoma City	87	183	223	–	43	46	7	26	530	523	88
*Tulsa	53	26	123	2	23	19	7	30	232	221	51
Paris	38	166	119	–	36	7	48	16	413	401	42
+London	22	810	15	–	19	28	13	21	706	681	44
+Bonn	14	245	361	–	8	4	3	10	629	624	19
Philadelphia	548	317	1,134	1	91	167	38	220	1,968	2,057	417
+Atlantic City	88	106	83	–	21	21	5	25	243	227	61
*Wilmington (DE)	23	20	63	3	20	32	13	30	201	205	21
*Scranton	36	50	80	–	19	14	4	15	182	191	27
*Harrisburg	44	7	88	–	31	15	7	123	269	285	27
Phoenix	165	183	405	2	53	74	12	50	779	731	229
+Albuquerque	104	48	173	–	39	30	19	67	374	395	73
*Tucson	36	83	117	–	15	10	7	24	256	248	24
Pittsburgh	195	49	268	2	45	72	12	138	584	628	142
+Charleston (WV)	95	36	220	–	33	26	8	48	371	388	72
Richmond	201	70	228	–	77	83	31	957	1,426	1,441	176
+Norfolk	104	81	237	–	36	63	13	55	485	423	171
*Roanoke	38	20	175	–	25	37	1	25	283	239	81
Rome	57	194	786	–	18	2	8	8	1,012	1,004	32
Sacramento	83	77	424	8	253	89	2	87	918	858	120
*Fresno	39	65	394	–	14	7	1	18	499	507	34
*Reno	36	18	14	2	20	13	2	18	87	97	24
*Bakersfield	30	47	400	2	19	18	2	15	501	502	25
San Antonio	198	101	882	–	73	83	43	78	1,241	1,267	136
+El Paso	136	127	136	–	22	30	5	47	369	418	87
*McAllen	36	57	374	–	15	9	8	9	472	478	31
San Diego	272	204	844	1	58	99	17	132	1,355	1,449	185
San Francisco	328	331	729	3	88	212	25	108	1,496	1,367	428
+San Jose	74	76	582	–	44	48	15	37	802	750	104
San Juan	130	208	733	–	45	23	18	52	1,079	1,033	166
Seattle	124	193	318	2	105	101	9	62	788	760	154
+Portland (OR)	141	98	142	1	44	48	8	80	418	438	110
+Spokane	41	27	127	–	23	14	1	28	220	183	64
*Anchorage	18	5	22	–	21	14	2	21	85	98	3
+Great Falls	34	7	78	2	28	15	14	26	170	160	42
St. Louis	299	118	457	–	143	60	27	261	1,066	1,073	254
Tampa	113	156	320	1	96	121	30	88	814	808	119
Washington	903	471	1,177	5	1,052	182	1,167	1,429	5,483	5,018	1,285
All Other	315	–	–	–	168	–	1,415	1	1,584	1,675	215
TOTAL	20,160	13,361	49,614	109	9,284	7,160	5,470	11,404	95,602	94,792	19,690

+Denotes Resident Office of Preceding Field Office.
*Denotes Resident Agency of Preceding Field Office.

COUNTERFEITING TRENDS
FISCAL YEARS 1984 – 1993

FISCAL YEAR	COUNTERFEIT NOTES				COUNTERFEIT COINS				NUMBER OF COUNTERFEIT NOTES RECEIVED		
	Passed on the Public	Seized Before Circulation	*Appearing Abroad	Total	Passed on the Public	Seized Before Circulation	Total	Grand Total Notes & Coins	Passed on the Public	Seized Before Circulation	*Appearing Abroad
1984	$7,559,392	$81,730,511	--	$89,289,903	$947	$1,721	$2,668	$89,292,571	207,030	2,066,661	--
1985	$6,925,758	$81,731,753	--	$88,657,511	$1,100	$709	$1,809	$88,659,320	182,764	1,335,176	--
1986	$6,870,335	$38,848,799	--	$45,719,134	$460	$463	$923	$45,720,057	200,696	746,550	--
1987	$9,322,348	$62,260,707	$18,192,077	$89,775,132	$468	$582	$1,050	$89,776,182	293,754	1,382,057	282,948
1988	$11,562,514	$110,076,015	$14,432,350	$136,070,979	$563	$582	$1,145	$136,072,124	283,884	2,310,789	235,086
1989	$13,641,963	$75,257,666	$88,172,251	$177,271,900	$1,566	$115	$1,681	$177,273,581	388,581	2,191,436	932,803
1990	$14,021,096	$66,337,675	$32,785,612	$113,144,383	$29	$126	$155	$113,144,538	389,737	1,642,632	535,876
1991	$17,142,926	$89,622,271	$30,752,009	$117,517,206	$125	$100	$225	$117,517,431	412,944	1,870,049	326,379
1992	$19,145,313	$60,731,139	$29,998,530	$109,874,982	$38	$54	$92	$109,875,074	467,242	1,841,612	596,405
1993	$19,601,697	$24,192,163	$120,767,004	$164,560,864	$2,705	$1,097	$3,802	$164,564,666	434,582	513,926	1,793,873

* Appearing Abroad figures not available prior to FY 1967.

COUNTERFEITING TRENDS
FISCAL YEARS 1984 – 1993
COUNTERFEIT PLANT OPERATIONS SUPPRESSED

FISCAL YEAR	NOTES	OFFICE MACHINE COPIES	FOOD COUPONS	FALSE I.D.	COINS	FOREIGN COUNTRY	*ALL OTHER	TOTAL
1984	83	–	–	–	2	7	–	92
1985	92	7	–	1	1	5	3	109
1986	76	30	–	6	1	23	–	136
1987	103	41	3	6	10	16	1	182
1988	93	24	–	9	10	19	3	158
1989	71	21	1	6	–	20	4	123
1990	73	33	–	29	2	18	2	157
1991	66	52	1	12	–	16	1	148
1992	59	49	–	10	–	14	5	137
1993	62	48	2	13	4	22	11	162

* Includes Food Coupon and all other U.S. obligations under USSS jurisdiction.

COUNTERFEIT ACTIVITY BY NOTE DENOMINATION
(Number of Notes Passed)

FISCAL YEAR 1993

DENOMINATION	FY 1991	FY 1992	FY 1993	% CHANGE
$1	12,201	8,751	5,800	-34%
$5	11,545	19,755	25,751	30%
$10	27,872	39,822	23,705	-40%
$20	225,478	247,560	213,967	-14%
$50	27,161	29,989	32,629	9%
$100	108,672	121,339	132,713	9%
*Other	26	26	17	-35%
TOTAL	412,955	467,242	434,582	-7%

*Includes $2, $22, $500, $1,000

COUNTERFEIT ACTIVITY
BY TYPE OF CASE

FISCAL YEAR 1993

	CASES RECEIVED	CASES CLOSED	CASES PENDING	ARRESTS
Passing	11,724	11,759	2,027	1,259
Distribution or Sale	268	275	127	65
Possession	666	691	326	314
Manufacturing	311	310	231	162
Other Counterfeit	592	464	295	99
TOTAL	13,561	13,499	3,006	1,899

COUNTERFEIT NOTES RECEIVED
FISCAL YEAR 1993

OFFICE	PASSED ON THE PUBLIC		SEIZED BEFORE CIRCULATION		NOTES APPEARING ABROAD	
	Number of Notes	Dollar Amount	Number of Notes	Dollar Amount	Number of Notes	Dollar Amount
Atlanta	5,401	$231,043	23,455	$756,256	–	–
*Savannah	462	$20,912	549	$10,810	–	–
*Albany (GA)	241	$10,557	2,684	$186,480	–	–
Baltimore	3,989	$190,625	578	$20,190	–	–
Birmingham	903	$33,529	4,094	$60,272	–	–
*Montgomery	220	$8,337	–	–	–	–
+Mobile	1,234	$43,370	801	$71,830	–	–
Boston	7,022	$323,787	175	$10,560	116	$10,800
*Portland (ME)	559	$27,658	–	–	–	–
*Concord	866	$40,072	3	$200	2	$200
+Providence	1,260	$56,185	331	$7,485	–	–
Buffalo	2,896	$151,011	9,718	$648,040	11,519	$1,149,680
*Rochester	707	$32,079	75	$3,450	–	–
+Syracuse	1,233	$60,825	1,156	$23,160	–	–
+Albany (NY)	1,159	$56,385	16,864	$1,610,812	100	$10,000
Charlotte	1,617	$74,184	147	$15,118	–	–
*Wilmington (NC)	406	$16,059	84	$3,865	–	–
+Raleigh	664	$35,527	466	$20,126	–	–
Chicago	11,960	$607,556	7,971	$204,745	–	–
+Milwaukee	751	$34,918	251	$14,155	–	–
+Madison	294	$16,389	423	$16,500	–	–
+Springfield (IL)	1,698	$31,112	6,716	$60,103	–	–
Cincinnati	635	$25,481	66	$522	–	–
*Dayton	482	$14,460	59	$4,030	–	–
+Columbus	949	$27,330	340	$6,800	–	–
Cleveland	2,081	$69,542	2,449	$165,430	–	–
*Canton	452	$16,942	–	–	–	–
*Toledo	484	$19,764	17	$1,700	–	–
Columbia	1,209	$51,000	4,122	$83,255	–	–
*Charleston (SC)	518	$18,478	45	$2,100	–	–
*Greenville	532	$14,719	47	$940	–	–
Dallas	7,148	$277,231	3,530	$492,056	–	–
*Lubbock	588	$21,225	–	–	–	–
*Tyler	344	$14,178	29	$322	–	–
Denver	1,820	$78,500	62	$1,240	–	–
*Cheyenne	107	$4,724	–	–	–	–
*Colorado Springs	237	$11,595	73	$5,950	–	–
+Salt Lake City	1,668	$47,173	1,396	$139,600	–	–
+Boise	224	$8,650	–	–	–	–
Detroit	7,495	$402,214	3,348	$118,880	–	–
+Grand Rapids	868	$32,223	68	$1,760	–	–
+Saginaw	594	$19,992	2,687	$18,857	–	–
Honolulu	1,162	$81,685	234	$23,200	3,515	$347,580
+Bangkok	–	–	–	–	40,697	$4,055,160
+Manila	–	–	–	–	417,421	$8,398,730
Houston	7,247	$382,864	20,349	$650,462	–	–
+Austin	1,137	$43,451	172	$11,141	–	–
Indianapolis	1,549	$60,496	8,109	$362,874	–	–
Jackson	759	$27,833	–	–	–	–
Jacksonville	2,713	$162,085	16,460	$206,260	–	–
+Orlando	6,143	$413,265	20,231	$581,790	–	–
Kansas City	1,349	$39,427	68	$3,720	–	–
*Wichita	391	$14,868	22	$440	–	–
*Springfield (MO)	253	$11,512	2	$200	–	–
+Omaha	771	$24,716	12	$12	–	–
+Des Moines	1,612	$22,386	4	$310	–	–
Little Rock	680	$27,931	23,478	$473,779	–	–
Los Angeles	68,329	$2,720,225	35,316	$1,210,133	–	–
*Ventura	3,053	$84,835	20,993	$998,290	–	–
+Riverside	5,662	$143,222	248	$13,680	–	–
+Santa Ana	8,309	$287,801	3,145	$82,056	–	–
+Las Vegas	4,849	$248,112	1,977	$94,100	–	–
Louisville	855	$31,050	638	$60,760	–	–
*Lexington	406	$20,367	1,136	$99,945	–	–

COUNTERFEIT NOTES RECEIVED
FISCAL YEAR 1993

OFFICE	PASSED ON THE PUBLIC		SEIZED BEFORE CIRCULATION		NOTES APPEARING ABROAD	
	Number of Notes	Dollar Amount	Number of Notes	Dollar Amount	Number of Notes	Dollar Amount
Memphis	921	$38,775	631	$57,500	–	–
Miami	33,921	$2,283,507	13,763	$803,565	178,239	$17,166,195
+West Palm Beach	2,292	$133,644	78	$1,840	–	–
Minneapolis	1,377	$70,458	519	$19,570	–	–
*Bismarck	141	$8,181	–	–	–	–
*Sioux Falls	176	$8,073	47	$940	–	–
Nashville	1,054	$45,509	2,525	$55,485	–	–
*Chattanooga	588	$21,201	9,225	$365,493	–	–
*Knoxville	1,295	$47,980	33	$660	–	–
New Orleans	1,838	$83,563	984	$46,226	–	–
*Shreveport	435	$16,785	357	$7,140	–	–
*Baton Rouge	680	$26,834	–	–	–	–
New York	41,522	$2,268,833	6,617	$392,501	7,110	$482,471
+White Plains	3,031	$154,910	31	$1,430	–	–
+Melville	7,826	$444,385	14,366	$858,690	–	–
+New Haven	2,978	$142,824	2,274	$59,340	–	–
Newark	14,069	$756,128	21,136	$319,910	4	$400
*Trenton	519	$25,506	12	$600	–	–
Oklahoma City	1,192	$44,069	854	$20,830	–	–
*Tulsa	547	$16,452	29,392	$2,189,840	2	$200
Paris	6	$320	–	–	223,441	$16,023,435
+London	–	–	–	–	125,968	$11,964,190
+Bonn	–	–	–	–	356,459	$18,754,700
Philadelphia	7,521	$364,579	1,819	$39,320	–	–
*Scranton	601	$36,160	–	–	–	–
*Harrisburg	391	$20,665	–	–	–	–
+Atlantic City	4,560	$263,620	782	$43,020	–	–
*Wilmington (DE)	825	$44,761	–	–	–	–
Phoenix	4,694	$176,610	33,434	$1,531,930	–	–
*Tucson	2,604	$120,067	129	$2,875	–	–
+Albuquerque	1,000	$41,457	1,336	$84,740	–	–
Pittsburgh	1,093	$47,310	925	$10,579	–	–
+Charleston (WV)	392	$14,000	410	$40,730	–	–
Richmond	1,086	$49,235	1	$20	–	–
*Roanoke	444	$18,265	329	$7,350	–	–
+Norfolk	980	$33,707	1,295	$20,951	–	–
Rome	–	–	–	–	430,023	$42,343,012
Sacramento	5,209	$176,005	7,700	$149,170	1	$5
*Fresno	5,962	$193,771	5,199	$490,581	–	–
*Reno	1,416	$52,463	4	$80	–	–
*Bakersfield	4,105	$94,409	1,335	$28,790	–	–
San Antonio	3,383	$155,504	32	$1,100	231	$13,105
*McAllen	2,018	$102,936	406	$15,285	204	$9,570
+El Paso	2,681	$109,105	1,174	$25,710	158	$6,970
San Diego	9,728	$296,734	30,779	$1,897,582	51	$1,861
San Francisco	25,645	$931,820	9,863	$241,337	–	–
+San Jose	6,727	$239,319	1,626	$25,790	–	–
San Juan	7,573	$254,695	2,762	$66,221	306	$13,110
Seattle	3,211	$146,073	7,388	$369,960	300	$15,000
*Anchorage	231	$17,045	7	$700	–	–
+Portland (OR)	2,211	$92,833	33,828	$3,377,950	1	$20
+Spokane	974	$31,806	106	$2,030	–	–
+Great Falls	264	$13,217	98	$4,760	5	$410
St. Louis	1,704	$56,398	244	$4,137	–	–
Tampa	4,977	$262,864	8,463	$612,400	–	–
Washington	12,377	$394,515	12,115	$254,736	–	–
TOTALS	434,582	$19,601,697	513,926	$24,192,163	1,793,873	$120,767,004

*Denotes Resident Agency of Preceding Field Office.
+Denotes Resident Office of Preceding Field Office.

SUMMARY OF CHECK FORGERY CASES
FISCAL YEARS 1989 – 1993

FISCAL YEAR	CASES RECEIVED	CASES INVESTIGATIVELY CLOSED	CASES ADMINISTRATIVELY CLOSED	TOTAL CLOSED
1989	41,217	18,316	24,546	42,862
1990	38,181	15,747	25,363	41,110
1991	61,088	13,924	47,037	60,961
1992	44,683	10,766	34,265	45,031
1993	49,614	10,755	39,076	49,831

FINANCIAL CRIME/FRAUD ACTIVITY
BY TYPE OF CASE

FISCAL YEAR 1993

	CASES RECEIVED	CASES CLOSED	CASES PENDING	ARRESTS
Securities	157	113	107	73
Direct Deposit	2,051	2,042	322	122
Access Device	3,367	2,961	2,888	2,073
Financial Crimes	852	602	701	367
Other	733	632	706	624
TOTAL	7,160	6,350	4,724	3,259

ARRESTS AND JUDICIAL DISPOSITIONS
FISCAL YEARS 1989–1993

ARREST BY VIOLATION SUMMARY

	1989	1990	1991	1992	1993
Counterfeiting	1,809	1,837	1,845	1,743	1,899
Forged Checks	2,847	2,200	1,885	1,485	1,556
Forged Bonds	25	30	27	21	22
Financial Crime/Fraud	1,997	2,121	2,623	2,755	3,259
Protective Intelligence	327	284	199	192	249
Other	587	409	403	294	505
TOTAL	7,592	6,881	6,982	6,490	7,490

ARREST DISPOSITION SUMMARY

	1989		1990		1991		1992		1993	
Convicted	6,773	(95.6%)	6,810	(96.4%)	6,295	(96.1%)	5,958	(96.5%)	6,868	(95.8%)
Acquitted	34	(0.5%)	38	(0.5%)	30	(0.5%)	36	(0.6%)	35	(0.5%)
Nolle Prosse	64	(0.9%)	65	(0.9%)	70	(1.1%)	48	(0.8%)	82	(1.1%)
No Bill	3	(0.0%)	5	(0.1%)	9	(0.1%)	4	(0.1%)	6	(0.1%)
Other Dismissals	208	(2.9%)	144	(2.0%)	145	(2.2%)	130	(2.1%)	175	(2.4%)
TOTAL	7,082	100.0%	7,062	100.0%	6,549	100.0%	6,176	100.0%	7,168	100.0%

DISPOSITION OF PROSECUTED ARRESTS

	1989	1990	1991	1992	1993
Convicted	99.5%	99.5%	99.5%	99.4%	99.5%
Acquitted	0.5%	0.5%	0.5%	0.6%	0.5%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%

ARRESTS AWAITING DISPOSITION

	1989	1990	1991	1992	1993
Counterfeiting	1,372	876	843	1,014	970
Check Forgery	1,278	437	493	513	495
Bond Forgery	37	11	7	8	7
Financial Crime/Fraud	1,332	1,088	1,394	1,904	2,175
All Other	695	297	245	259	296
TOTAL	4,714	2,711	2,982	3,698	3,943

ARRESTS
FISCAL YEAR 1993

OFFICE	COUNTERFEITING	CHECK	BOND	FIN. CRIME/ FRAUD	PROTECTIVE INTELLIGENCE	ALL OTHER	TOTAL
Atlanta	44	28	–	59	4	19	154
*Savannah	10	9	–	4	1	–	24
*Albany (GA)	3	11	–	11	1	–	26
Baltimore	39	30	1	43	2	–	115
Birmingham	9	40	–	21	–	–	70
+Mobile	9	25	–	19	–	–	53
*Montgomery	5	20	–	3	1	–	29
Boston	17	13	1	47	1	11	90
+Providence	11	21	1	18	–	–	51
*Portland (ME)	–	3	–	17	2	2	24
*Concord	2	5	–	4	–	–	11
Buffalo	25	5	–	48	1	1	78
+Syracuse	20	20	–	7	–	1	48
*Rochester	13	10	–	15	–	–	38
+Albany (NY)	18	23	–	18	1	–	60
Charlotte	29	32	1	55	1	2	120
+Raleigh	5	11	–	3	–	–	19
*Wilmington (NC)	13	18	–	3	1	–	35
Chicago	56	37	–	189	16	14	312
+Milwaukee	5	13	–	12	4	–	34
+Springfield (IL)	19	9	1	16	–	8	53
+Madison	2	1	–	3	5	–	11
Cincinnati	8	7	–	76	–	1	92
+Columbus	12	6	–	18	1	1	38
*Dayton	4	2	–	10	2	–	18
Cleveland	15	22	–	68	–	2	107
*Canton	3	10	–	12	–	–	25
*Toledo	1	5	–	9	2	1	18
Columbia	15	54	–	18	–	2	87
*Charleston (SC)	7	13	–	3	–	1	24
*Greenville	8	23	–	17	–	3	51
Dallas	32	28	–	50	–	44	152
*Fort Worth	–	–	–	–	–	–	–
*Lubbock	11	2	–	20	–	1	34
*Tyler	6	18	–	4	1	–	29
Denver	8	11	–	10	–	3	32
+Salt Lake City	8	8	–	14	2	1	33
*Cheyenne	3	2	–	2	1	–	8
+Boise	–	–	–	5	–	2	7
*Coloredo Springs	8	2	–	–	1	1	10
Detroit	35	15	–	101	8	126	285
+Grand Rapids	5	1	–	16	–	–	22
+Saginaw	10	3	–	21	3	12	49
Honolulu	7	1	–	17	–	2	27
+Bangkok	–	–	–	–	–	–	–
+Manila	–	–	–	–	–	–	–
Houston	65	37	–	116	–	5	223
+Austin	21	12	–	10	4	8	55
Indianapolis	8	33	–	37	10	1	89
Jackson	5	10	–	25	1	1	42
Jacksonville	26	22	–	60	4	2	114
+Orlando	20	2	–	34	1	3	60
Kansas City	11	7	–	30	4	–	52
+Omaha	3	6	–	11	–	–	20
*Wichita	2	1	–	15	1	1	20
+Des Moines	3	–	–	6	–	–	9
*Springfield (MO)	1	–	–	1	–	–	2
Little Rock	8	36	–	35	3	8	88
Los Angeles	115	68	–	71	28	11	291
+Riverside	22	–	–	2	6	1	31
+Santa Ana	29	7	–	21	2	–	59
+Las Vegas	28	13	–	74	5	21	141
*Ventura	16	3	–	5	2	–	26
Louisville	5	15	–	29	5	–	54
*Lexington	3	4	–	3	–	–	10

ARRESTS
FISCAL YEAR 1993

OFFICE	COUNTERFEITING	CHECK	BOND	FIN. CRIME/ FRAUD	PROTECTIVE INTELLIGENCE	ALL OTHER	TOTAL
Memphis	5	9	–	45	–	6	65
Miami	92	41	–	151	–	2	286
+West Palm Beach	9	–	–	11	2	2	24
Minneapolis	16	3	–	12	4	4	39
*Bismarck	1	–	–	5	1	–	7
*Sioux Falls	7	5	–	–	–	1	13
Nashville	11	4	–	16	2	–	33
*Chattanooga	12	4	–	14	1	–	31
*Knoxville	6	1	–	1	–	–	8
New Orleans	12	1	–	14	1	1	29
*Shreveport	5	–	–	–	1	–	6
*Baton Rouge	2	4	1	7	1	–	15
New York	146	96	1	286	6	53	590
+White Plains	8	9	–	66	–	–	83
+Melville	26	6	1	55	–	–	90
+New Haven	17	21	1	44	6	–	69
Newark	46	84	2	72	7	9	220
*Trenton	3	2	–	9	1	3	16
Oklahoma City	19	10	–	7	2	–	38
*Tulsa	6	3	2	2	1	2	16
Paris	–	–	–	–	–	–	–
+London	–	–	–	–	–	–	–
+Bonn	–	–	–	–	–	–	–
Philadelphia	11	29	1	78	2	19	140
+Atlantic City	23	11	1	14	1	1	51
*Wilmington (DE)	–	3	–	21	–	1	25
*Scranton	2	10	–	–	1	–	13
*Harrisburg	2	5	–	20	–	3	30
Phoenix	33	7	–	14	–	4	58
+Albuquerque	17	14	–	17	–	–	48
*Tucson	7	4	–	23	–	–	34
Pittsburgh	10	18	–	66	–	8	102
+Charleston (WV)	10	8	–	11	1	3	33
Richmond	5	30	–	32	8	19	94
+Norfolk	11	8	–	22	1	–	42
*Roanoke	8	10	–	1	1	–	18
Rome	–	–	–	–	–	–	–
Sacramento	14	1	–	4	2	–	21
*Fresno	20	–	–	1	–	–	21
*Reno	5	1	–	7	–	–	13
*Bakersfield	24	3	–	1	–	1	29
San Antonio	14	7	1	25	3	–	50
+El Paso	5	3	–	3	2	1	14
*McAllen	7	3	–	4	–	1	15
San Diego	34	8	1	22	5	2	70
San Francisco	39	6	–	50	5	8	108
+San Jose	7	2	–	8	1	–	18
San Juan	19	7	–	20	–	2	48
Seattle	12	3	3	26	10	–	54
+Portland (OR)	18	8	–	12	1	–	37
+Spokane	5	4	–	30	4	–	43
*Anchorage	1	–	–	2	–	–	–
+Great Falls	3	10	–	4	2	4	23
St. Louis	18	33	–	41	1	8	99
Tampa	34	14	1	60	13	–	122
Washington	83	94	1	120	13	18	329
TOTALS	1,699	1,556	22	3,259	249	505	7,490
PERCENTAGE	25%	21%	0%	44%	3%	7%	100%

+Denotes Resident Office of Preceding Field Office.
*Denotes Resident Agency of Preceding Field Office.

ARREST DISPOSITIONS
FISCAL YEAR 1993

OFFICE	CONVICTIONS									
	Counterfeiting	Forged Checks	Forged Bonds	Fin. Crime/ Fraud	Protective Intelligence	All Other	Subtotal	**Other Dispositions	Grand Total	Percent Convicted
Atlanta	36	28	–	62	3	18	148	3	151	98%
*Savannah	10	11	–	2	2	–	25	–	25	100%
*Albany (GA)	4	16	–	5	1	–	26	–	26	100%
Baltimore	34	26	1	36	3	–	100	17	117	85%
Birmingham	13	40	–	21	–	–	74	2	76	97%
+Mobile	11	11	–	18	1	–	39	–	39	100%
*Montgomery	3	22	–	1	–	–	26	1	27	96%
Boston	22	13	1	30	1	11	87	1	88	99%
+Providence	11	18	1	27	–	3	60	1	61	98%
*Portland (ME)	3	4	–	6	2	2	17	1	18	94%
*Concord	8	8	–	3	–	2	18	–	18	100%
Buffalo	24	2	–	47	–	1	74	–	74	100%
+Syracuse	15	21	–	9	1	1	47	–	47	100%
*Rochester	12	10	–	13	–	–	35	–	35	100%
+Albany (NY)	21	23	–	16	1	1	62	3	65	95%
Charlotte	42	38	1	60	1	1	143	3	146	98%
+Raleigh	4	10	–	–	–	–	14	2	16	88%
*Wilmington (NC)	12	15	–	3	1	–	31	–	31	100%
Chicago	57	37	–	160	11	22	287	17	304	94%
+Milwaukee	3	8	–	9	4	–	22	1	23	96%
+Springfield (IL)	15	6	1	15	–	–	40	1	41	98%
+Madison	2	1	–	1	3	–	8	–	8	100%
Cincinnati	8	7	–	54	–	1	70	–	70	100%
+Columbus	17	7	–	20	1	–	45	–	45	100%
*Dayton	1	2	–	7	2	–	12	–	12	100%
Cleveland	6	21	–	78	1	1	110	3	113	97%
*Canton	3	8	–	13	–	–	25	–	25	100%
*Toledo	2	3	–	9	3	–	17	–	17	100%
Columbia	17	48	–	14	–	2	82	3	85	96%
*Charleston (SC)	9	17	–	3	–	2	31	–	31	100%
*Greenville	8	26	–	22	–	1	57	4	61	93%
Dallas	27	22	–	35	1	28	113	2	115	98%
*Lubbock	11	–	–	18	–	–	29	–	29	100%
*Tyler	6	18	–	3	–	–	27	1	28	96%
Denver	12	12	–	10	–	3	37	10	47	79%
+Salt Lake City	7	7	–	8	1	1	25	2	27	93%
*Cheyenne	3	2	–	8	1	–	14	–	14	100%
+Boise	–	–	–	3	–	2	5	–	5	100%
*Colorado Springs	7	3	–	–	1	1	12	–	12	100%
Detroit	13	8	–	77	8	125	231	5	236	98%
+Grand Rapids	8	2	–	16	–	–	26	–	26	100%
+Saginaw	12	3	–	18	4	6	43	2	45	96%
Honolulu	3	4	–	27	1	1	36	1	37	97%
+Bangkok	–	–	–	–	–	–	–	–	–	–
+Manila	–	–	–	–	–	–	–	–	–	–
Houston	51	30	–	83	–	2	166	–	166	100%
+Austin	22	13	–	11	3	7	56	–	56	100%
Indianapolis	11	32	–	36	11	1	91	–	91	100%
Jackson	3	15	–	28	–	1	45	–	45	100%
Jacksonville	32	27	–	52	3	2	116	2	118	98%
+Orlando	12	2	–	33	1	3	51	2	53	96%
Kansas City	9	6	–	37	1	1	54	–	54	100%
+Omaha	5	3	–	15	–	–	23	–	23	100%
*Wichita	3	2	–	25	1	–	31	–	31	100%
+Des Moines	3	1	–	6	–	–	9	2	11	82%
*Springfield (MO)	3	–	–	–	1	–	4	–	4	100%
Little Rock	7	44	–	33	4	9	99	–	99	100%
Los Angeles	87	62	–	83	13	6	246	19	265	93%
+Riverside	24	–	–	–	6	1	31	4	35	89%
+Santa Ana	26	7	–	18	2	–	53	3	56	95%
+Las Vegas	21	14	–	45	4	23	107	3	110	97%
*Ventura	14	3	–	5	2	2	26	–	26	100%
Louisville	7	13	–	29	3	–	56	2	58	97%
*Lexington	7	5	–	2	1	–	15	–	15	100%

ARREST DISPOSITIONS
FISCAL YEAR 1993

OFFICE	CONVICTIONS									
	Counterfeiting	Forged Checks	Forged Bonds	Fin. Crime/ Fraud	Protective Intelligence	All Other	Subtotal	**Other Dispositions	Grand Total	Percent Convicted
Memphis	8	25	–	63	1	8	105	–	105	100%
Miami	81	35	–	95	–	2	213	9	222	96%
+West Palm Beach	10	–	–	11	2	1	33	–	33	100%
Minneapolis	15	4	–	18	5	4	46	1	47	98%
*Bismarck	1	1	–	6	1	–	11	1	12	92%
*Sioux Falls	10	3	–	–	–	1	16	–	16	100%
Nashville	14	7	–	11	1	–	33	2	35	94%
*Chattanooga	4	4	–	6	1	–	15	–	15	100%
*Knoxville	8	1	–	6	–	–	14	1	15	93%
New Orleans	14	4	–	10	1	1	30	1	31	97%
*Shreveport	6	–	–	–	1	–	8	–	8	100%
*Baton Rouge	2	4	1	7	1	–	15	–	15	100%
New York	132	64	1	205	–	44	446	32	478	93%
+White Plains	7	9	–	42	–	2	80	1	81	98%
+Melville	22	3	1	53	–	2	83	27	110	75%
+New Haven	18	28	1	41	8	–	94	1	95	99%
Newark	30	102	3	81	9	9	240	9	249	96%
*Trenton	2	3	–	6	–	–	11	–	11	100%
Oklahoma City	10	7	–	10	1	–	37	–	37	100%
*Tulsa	3	2	2	4	–	2	13	1	14	93%
Paris	–	–	–	–	–	–	–	–	–	–
+London	–	–	–	–	–	–	–	–	–	–
+Bonn	–	–	–	–	–	–	–	–	–	–
Philadelphia	21	31	1	63	3	19	138	7	145	95%
+Atlantic City	26	10	–	13	1	1	51	2	53	96%
*Wilmington (DE)	–	1	–	29	–	1	31	1	32	97%
*Scranton	4	9	–	–	1	–	14	–	14	100%
*Harrisburg	2	5	–	6	–	3	15	–	15	100%
Phoenix	36	8	–	13	–	4	59	–	59	100%
+Albuquerque	12	13	–	16	–	–	41	3	44	93%
*Tucson	15	4	–	23	–	–	42	–	42	100%
Pittsburgh	2	19	–	58	–	9	88	3	89	97%
+Charleston (WV)	10	8	–	10	1	4	33	1	34	97%
Richmond	6	25	–	30	8	4	72	1	73	99%
+Norfolk	12	8	–	20	1	–	41	–	41	100%
*Roanoke	8	10	–	1	1	–	16	–	18	100%
Rome	–	–	–	–	–	–	–	–	–	–
Sacramento	11	2	–	4	2	–	19	–	19	100%
*Fresno	20	–	–	–	1	–	21	–	21	100%
*Reno	5	1	–	8	–	–	14	–	14	100%
*Bakersfield	24	3	–	1	–	1	29	–	29	100%
San Antonio	14	8	1	21	3	–	47	1	48	98%
+El Paso	2	3	–	18	1	1	25	–	25	100%
*McAllen	3	4	–	1	–	1	8	–	8	100%
San Diego	28	8	1	26	4	2	69	3	72	96%
San Francisco	21	8	–	58	6	9	99	1	100	99%
+San Jose	8	1	–	3	1	–	13	–	13	100%
San Juan	17	8	–	18	–	2	43	3	46	93%
Seattle	17	3	–	23	9	1	53	1	54	98%
+Portland (OR)	22	5	–	11	2	–	40	2	42	95%
+Spokane	8	4	–	10	3	–	25	–	25	100%
*Anchorage	1	1	–	2	–	–	4	–	4	100%
+Great Falls	3	4	–	6	3	–	15	–	15	100%
St. Louis	17	38	–	27	1	7	90	–	90	100%
Tampa	26	13	1	31	15	–	86	1	87	99%
Washington	92	78	2	97	14	9	292	61	353	83%
TOTALS	1,819	1,515	20	2,836	226	452	6,868	300	7,168	96%

*Denotes Resident Agency of Preceding Field Office.
+ Denotes Resident Office of Preceding Field Office.
**Other Dispositions include Acquittals, Nolle Prosse, No Bill, and Dismissals.

SUMMARY OF PROTECTIVE TRAVEL
BY PROTECTEE CATEGORY
FISCAL YEAR 1991 – 1993

	NUMBER OF STOPS		
	FY 1991	FY 1992	FY 1993
Presidential	1,085	1,255	868
Vice Presidential	881	1,005	737
Former President	1,108	1,239	1,465
Foreign Dignitary	823	964	762
Candidate/Nominee	0	1,015	591
Other Protectees	146	141	277
TOTAL	4,043	5,619	4,700

CLASSIFICATION OF CASE TYPES

The following table depicts how investigative case types are used to classify statistics by category.

CATEGORY	CASE TYPE
COUNTERFEIT	710000–722999, 726000–733999, 755000–755999
CHECK FORGERY	750000–750999
BOND FORGERY	751000–751999
PROTECTIVE INTELLIGENCE	671000–677999
OTHER CRIMINAL	701000–702999, 704000–707999, 752000–754999, 756000–762020, 762022–762999, 800000–801999, 804000–804999, 811000–812999, 816000–817999, 848000–848999
NON–CRIMINAL	601000–601999, 603000–640999, 703000–703999, 765000–765999, 802000–803999, 805000–810999, 815000, 819000–819999, 849000, 850000–850999
FINANCIAL CRIME/FRAUD	762021, 723000–725999, 763000–764999, 766000–780999, 813000–814999, 818000–818999

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Origin of Statistical Data

Description

The Annual Statistical Summary is produced by the Office of Administration, Management and Organization Division. Figures contained in the FY 1993 Annual Statistical Summary were provided by the Workload and Statistical Reporting System (WSRS).

The purpose of WSRS is to provide managers with timely and relevant information to support planning, financial decision making, office productivity assessments, and resource allocation decisions.

The WSRS obtains its data directly from several Secret Service systems for the Annual Statistical Summary. These "source systems" are:

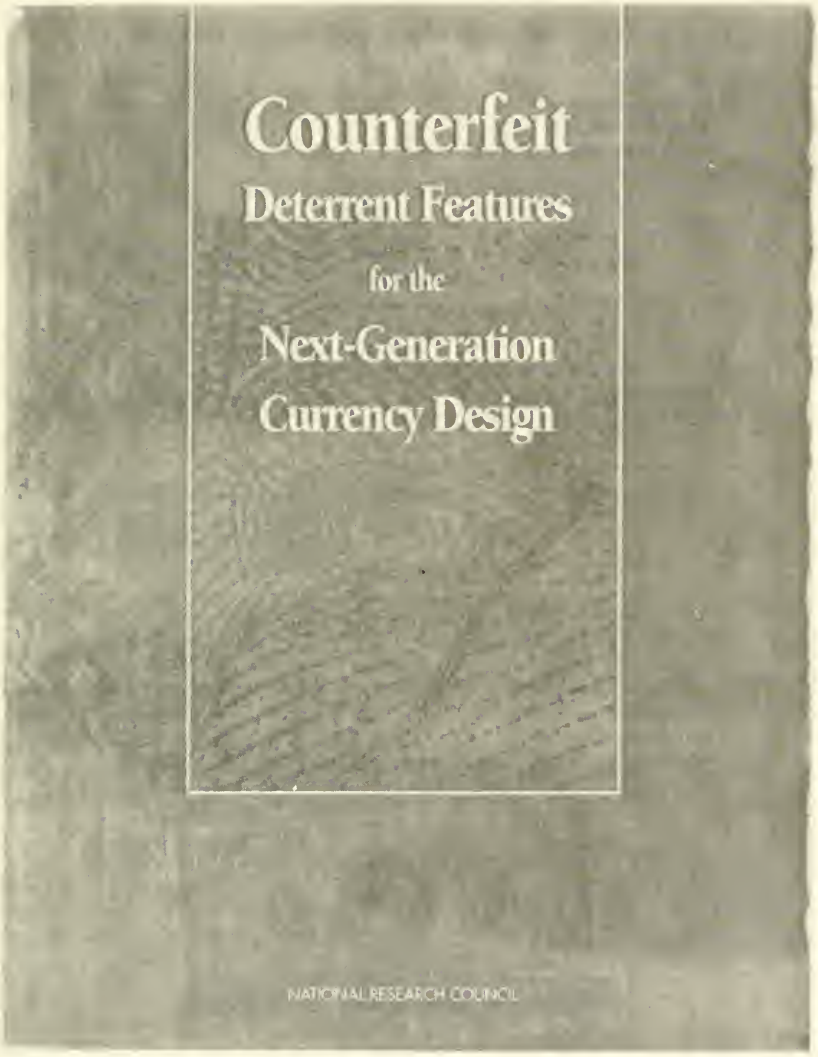
- Master Central Index (MCI),
- Agent Management and Protection Support (AMPS),
- Counterfeit/Contraband System (CFT/004),
- Master Personnel System (MPS), and,
- Manhours Reporting System (MRS).

The WSRS interrelates all source data under one summary database. The system provides a current and historical portrayal of Secret Service activity in which data is summarized by date, office, case type and protectee.

Statistics in the Annual Statistical Summary reflect summarized data from Field Offices, Resident Offices, Resident Agencies and Protective Divisions.

Contacts

Secret Service personnel requesting further information from WSRS, should contact the Management and Organization Division, Quantitative Studies and Statistical Systems Branch, FTS 202-435-7010 for assistance.


Counterfeit
Deterrent Features
for the
Next-Generation
Currency Design
NATIONAL RESEARCH COUNCIL

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EXECUTIVE SUMMARY

PROBLEM DEFINITIONS

Highly sophisticated and technologically advanced reprographic systems are no longer the tools of the skilled technician but are widely available to, and accepted by, the general public. Ease of use and versatility, facilitated by user-friendly control panels, permit an unskilled user to make faithful, full-color reproductions of any document. Reproduction quality, ease of access, and relative freedom from discovery combine to create an atmosphere within which many individuals may experiment with the replication of U.S. banknotes: committing the so-called crime of opportunity. To the dedicated semiprofessional or professional counterfeiter, these reprographic machines are turnkey systems that can be purchased on the open market. They are easily installed and permit limited mass production. Law enforcement agencies could be overwhelmed by these counterfeits, since traceability to the source would be very difficult. The quality of the reproduction can be very high, not solely dependent on the skill of the counterfeiter. Even if the total monetary value of counterfeits grows at a modest rate, widespread counterfeiting capability could reduce public confidence in U.S. currency.

Traditional counterfeiting deterrents, such as unique high-quality paper, fine-line engravings and high-pressure (intaglio) printing, were adequate in the past to restrict counterfeiting to the dedicated craftsman with access to a printing press; these have kept counterfeiting to a reasonably manageable level in the United States. However, with the advent of advanced reprographic systems, these methods are no longer sufficient. Indeed, samples provided by the U.S. Secret Service, made on a commercially available color copier, were very impressive and, in the committee's estimation, would have no trouble in passing all but the most demanding visual inspection. Modern deterrents are required that possess a highly visible means of authentication that is difficult to reproduce and is readily observable by an individual unaided, or using low-cost, relatively unobtrusive devices. This latter requirement is important because of the perceived reluctance of the public to appear obvious in the inspection of a banknote.[1] The intent is to make the attempted forgery so obviously different from a genuine note that it is either readily recognized and intercepted at the first pass, or, even better, the counterfeiter decides that it is not good enough to risk passing.

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[1]Close inspection of credit cards and checks by point-of-sale personnel is accepted as a matter of course; the committee's opinion is that close scrutiny of banknotes would become acceptable as well if it were done rapidly with few false rejections.

Redesign of the U.S. banknotes is required to accommodate additional counterfeit-deterrent features. The extent of the design changes will depend upon the additional features selected, and which current ones are removed. Changes to banknote design are subject to several constraints. First, the size of the notes should not be changed in a manner that would prevent co-circulation of old and new notes and continued use of vending machines, automated teller machines, change machines, and Federal Reserve Bank sorting and authentication sensors and equipment. Design modifications to the note should not reduce circulation life or produce environmental hazards, either in manufacture, during circulation, or at the time of disposal. Finally, the evaluation of changes must include consideration of the manufacturing capability and cost.

The U.S. Bureau of Engraving and Printing (BEP) is among the world's largest printers of banknotes, and it has a history of introducing innovations in printing equipment. This tradition should certainly be continued as plans are made for time-phasing the introduction of advanced deterrent features. Incorporation of some desirable features may lead to the need for future additional modernization of production equipment and facilities. For example, new intaglio presses would be required to greatly improve the front-to-back registration, and offset printing of some features would be needed if high-resolution lines or dots are required.

MAJOR FINDINGS

U.S. banknotes remain very important to the economy of the United States, and to many foreign countries, as the U.S. dollar is a *de facto* world currency. Thus, the security of U.S. currency is interwoven with the economic well-being of the United States and the U.S. currency's stature in the world.

The conclusions and recommendations presented in the previous National Materials Advisory Board reports, are as relevant today as they were 6 years ago (NRC, 1985, 1987). The potential magnitude of the threat today is at least as great as was projected in those reports and could grow at a faster rate, perhaps geometrically. The print resolution of color copiers and printers will continue to improve and will soon challenge the resolution capabilities of present-day intaglio printing. Therefore, small-size intaglio printed characters or letters (microprinting) introduced on series 1990 banknotes will provide only temporary counterfeiting deterrence. Color reprographics technology continues to advance rapidly. It exhibits exceptional color quality and resolution and is starting to permeate all segments of the market, from business to home. Market growth is proceeding at a fast pace, and many companies are manufacturing color copiers and printers; the resulting competitive pressures are driving unit cost down. Placement of new non-impact color copier and printer systems in 1995 is expected to exceed 2 million units in the United States, and a similar number is expected for the rest of the world.

Widespread availability of advanced reprographic systems and their relative ease of use present an environment for occasional, casual counterfeiting. These systems also provide a convenient base technology for the more professional counterfeiters so that they need onlyconcentrate on simulating the deterrent features and not on the printing process itself. Sophisticated and inexpensive image-processing software is available that can be coupled with

high-resolution scanners and color printers to provide an opportunity for an advanced amateur, such as a computer hacker, to experiment with counterfeiting in relative privacy. These individuals will not only view the task as a challenge but may share their techniques and results over computer networks.

At the present time, the total value of counterfeit notes that enter circulation each year in the United States is relatively small compared with that of all of the currency in circulation. In 1991, the Federal Reserve System handled $265 billion worth of U.S. banknotes. In that same year, $15.1 million in counterfeit notes were passed in the United States. In addition, the Secret Service seized $87 million in counterfeit notes before they entered circulation. Most of these counterfeit notes (90 percent) were produced using a lithographic process; this requires considerable skill, specialized equipment, and special supplies obtainable from a limited number of suppliers (Brown, 1993a).

The amount of counterfeit notes produced using non-impact reprographic technology (i.e., copiers, scanners, and computer printers) is presently small in contrast to that produced by lithographic processes that use specialized equipment. The 1992 data indicates that counterfeits produced using non-impact reprographic technology accounted for $6 million to $8 million of the total amount; these types of counterfeits have been doubling for the past three years (Brown and Einsel, 1992). The most recent 1993 counterfeiting data indicates a dramatic increase in casual counterfeiting using ink-jet technology (Brown, 1993b). These reprographic methods are pernicious, because they do not provide the Secret Service with leads through which the production source can be traced.

The counterfeiting of U.S. currency overseas is also a problem. Interpol, an international police organization composed of 169 member countries, rarely encounters counterfeit notes of currencies that have incorporated sophisticated security features. Most of the counterfeit cases they are investigating deal with U.S. banknotes (87.6 percent; Kendall, 1993). In 1991, $50 million in counterfeit U.S. notes were detected overseas. While part of the overseas problem can be attributed to unfamiliarity with U.S. currency (although this is by no means proven to be true), it may be due primarily to the relative ease with which U.S. currency can be counterfeited compared with the currency of other industrialized countries, most of whom have recently redesigned their currency. Also, U.S. currency is widely accepted throughout the world, making it a prime target for international counterfeiters.

In line with the assessment of the Committee on Next-Generation Currency that these will be the primary methods for counterfeiting in the future, the rate of growth of notes created using color reprographic equipment is growing geometrically. An illustration of how large the problem could become is to assume that the rate of counterfeiting with non-impact reprographic equipment doubles every year until year 2000, as it has since 1989. With this assumption, the present day value of counterfeit currency could grow to $1.6 billion to $2 billion in the year 2000. Obviously, such a large amount of counterfeiting would cause severe problems for the economy. Appropriate actions can, and undoubtedly will, be taken long before counterfeiting becomes a problem of such proportions.

The combination of creative simulation by the counterfeiter and inattentiveness of the general public has permitted some very poor counterfeits to enter circulation. While they are eventually detected and removed with machine-based authentication systems, these are virtually untraceable if made by a copier or printer. Many other nations regularly change their currency designs, oftentimes to add advanced deterrent features. Some of these features are candidates for use on U.S. currency. Information regarding the effectiveness and durability of these features, derived from actual circulation experience, would be highly useful in judging their value as deterrents and suitability for use. At present, however, very little specific information appears to be shared among countries regarding effectiveness, cost, and durability of particular features.

The distinctive feel of U. S. banknotes this is imparted by a combination of intaglio printing and unique paper substrate continues to serve as an important method for banknote authentication by individuals who handle money on a regular basis. The security thread introduced in series 1990 banknotes will be effective once it is present in most U.S. banknotes,[2] and the public becomes more aware of it. There are a number of additional deterrents now being considered for incorporation in U.S. banknotes. A systematic method is required to compare the advantages, limitations, and costs of each.

FEATURE-ASSESSMENT CONSIDERATIONS

Over the course of this study, technical information about numerous deterrent features was gathered from vendors, expert witnesses, the BEP, the Federal Reserve Board, and the Secret Service. This information ranged from conceptual proposals with little or no supporting data to prototypes with extensive test results. A limited amount of data were also available for features already in use on the currency of other countries.

An extensive list of features was generated that represents a wide variety of technologies. Many candidates were based on a common theme. They were considered as a generic class unless a specific implementation exhibited highly advantageous characteristics.

The overall effectiveness of an individual feature was determined by two primary considerations: resistance against technical threat and technical success probability.

Resistance against technical threat assumes success in deploying the deterrent and is a measure of the feature's value as a counterfeit deterrent. This category is subdivided in the four subcategories: (1) visual and tactile recognizability, (2) inherent resistance to copying, (3) resistance to simulation, and (4) ease of machine readability.

Technical Success Probability is a measure of the risk of incorporating a feature into a banknote. This category is also subdivided into four subcategories to identify the primary areas of consideration. These are (1) availability and manufacturability, (2) change to recurring production costs, (3) durability, and (4) capital cost of new or modified production tooling.

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[2]The security thread was present in about half the U.S. $50 and $100 banknotes in mid 1993.

Environmental considerations, in manufacture as well as disposal, were discussed where appropriate but not included as specific factors, as the majority of features did not appear to present a hazard. The selection of deterrent features by the BEP for eventual use should include such an evaluation.

The two categories with their eight subcategories form the cornerstone of the committee's evaluation by helping identify the relative strengths and weaknesses of each feature. Some caveats are in order. First, the subfactors are not equally weighted; depending on the threat scenario, some would be more important than others. For example, visual and tactile recognizability is much more important than machine readability when considering detection by the person on the street, whereas the opposite is true when considering machine validation. In a similar manner, the inherent resistance to copying addresses all levels of counterfeiter expertise, from unskilled to highly skilled, while the resistance to simulation targets those individuals willing to perform at least one additional step (the serious hackers and professionals) and will likely discourage the casual counterfeiter as well.

The committee did not expect that any single feature would rank first in all categories, and none did. Hence, the committee thought it was important to understand the intent (target) of each deterrent. In order to provide a multifaceted system of deterrents, consideration should be given to deploying multiple features that complement each other. A well-designed set would address issues of visibility and recognizability under different viewing conditions; require different methods and skills for simulation; and, generally, require too many additional process steps for anyone but the dedicated professional to attempt. Some caution is required, however. The use of too many features could overwhelm the public and thereby reduce the overall effectiveness of the deterrents.

CONCLUSIONS

The increased availability of advanced color copiers and systems composed of a computer-scanner, and printer makes widespread counterfeiting of U.S. banknotes a real and substantial threat. Ready access and ease of use could lead to abuse by "casual" counterfeiters. Copiers certainly pose a significant threat, but the most important threat in the foreseeable future, in the judgment of the Committee on Next-Generation Currency Design, is color scanner-computer-printer systems, aided by the continuing evolution of more-sophisticated image-processing software. These systems also provide additional opportunities for professional counterfeiters.

The system of deterrence used today has been very efficient, as measured by the relatively low rate of counterfeiting in the United States. The combination of a unique paper substrate, security thread (introduced starting in Series 1990 banknotes), fine-line engraved portraits, and intaglio printing has played an important role in this deterrence. The system should not, however, be assumed effective against future threats.

Features that defeat the casual counterfeiter do not necessarily work effectively against professional counterfeiters. Casual, opportunistic counterfeiters do not have the skills,

resources, or determination to defeat sophisticated individual deterrents or combinations of them, whereas professional counterfeiters do have these skills and the resources to simulate or duplicate any single deterrent, and probably most combinations, given sufficient time. Certain combinations of features, rather than features acting alone, offer robust potential for defeating the casual counterfeiter and slowing down the professional. In the committee's opinion, the set of deterrent features need not be the same on all denominations of banknotes. For example, more sophisticated features may be used on the $100 banknote than on a $5 (or $1) note.[3]

Many of the candidate deterrent features are effective within a particular set of conditions. For example, diffraction-based optically variable devices, such as holograms or kinegrams, while effective on rigid substrates such as credit cards, at present lack durability on a flexible substrate. Also, these features, though effective against casual counterfeiters, can be easily simulated by even semiprofessional counterfeiters. Metallized or specular reflecting features also offer deterrent protection against casual copying. As with the diffraction-based features, however, there are a number of durability issues. Color-shifting inks, on the other hand, have been shown to be more durable than diffraction-based features and are also effective against the casual counterfeiter if the public is willing to carefully manipulate the banknote to observe the color change. (They are in widespread use in foreign currency, stamps, and other security documents.)

Innovative covert deterrence concepts, such as unique three-dimensional random pattern generation combined with encryption of the pattern, are highly resistant to counterfeiting and effective against all levels of counterfeiting expertise. But they would not at present be a first line of defense, as they require machine sensing, and such devices are not yet available at most points of sale. The first generation of local, built-in intelligence for copiers and scanners, which prohibits banknote reproduction, does not appear to be a universally promising first line of defense either; as presently implemented, these systems store a limited number of banknote designs, and the controller can probably be circumvented by those who are electronically proficient. Also, there are many copiers, scanners, and printers that do not offer this feature.

It appears to the committee that the public in the United States, for a variety of reasons, does not aggressively examine its banknotes and report counterfeits. But it is not obvious to the committee what incentives could improve the situation. (The degree of inspection is probably correlated to experience in finding a counterfeit note.) An appropriately designed reward system may provide more of an incentive for people and businesses to report counterfeit notes. Personnel employed at points of sale who regularly handle cash, are a crucial line of defense (as are vending machines). The committee's opinion is that the casual counterfeiter would be significantly deterred if relatively simple, speedy, and inexpensive point-of-sale devices were commercially available and commonly used to authenticate banknotes. Such devices would detect one or more deterrent features incorporated in the note.

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[3]This policy may already be in place. For example, the BEP has not announced plans to incorporate the security thread into the $1 note.

The use of color alone as a deterrent offers little protection against today's advanced copying technology. However, color used in combination with other features can provide enhanced visibility of deterrents and thus aid the general public in identifying counterfeits. Color can also be used to differentiate between different denominations.

It appears technically feasible to incorporate a low-cost application-specific integrated circuit in all color printers and copiers to encode the machine serial number on all output pages in a way that is not obvious. Assuming that such a circuit were tamper proof, it would allow forensic analysis of the copy to identify the owner of the machine that produced the counterfeit. It also would provide law enforcement authorities with the means to determine the volume of counterfeit produced from a particular source. Once the public became aware of this capability, it would serve as an excellent deterrent against casual counterfeiting (Canon, 1990).

Currently, there is no clear association between some of the banknote testing specifications applied by the BEP and the real-world use of currency. This leads to a concern that potentially effective counterfeiting deterrents may be erroneously eliminated from consideration.

A long-term deterrent strategy must anticipate and lead the evolution of reprographic systems and the level of expertise of the counterfeiting community. Technological progress in non-impact printing will continue to be driven by market forces in a never-ending quest for better accuracy and quality, and it is imperative that the Department of Treasury be informed of developments in ample time to respond to future threats. In a similar fashion, there is a considerable amount of basic research being conducted in the academic and industrial community that could have relevance for future counterfeit deterrence. However, the link between this research and the BEP's long-term needs would not normally be made in a timely way unless specific mechanisms were put in place.

RECOMMENDATIONS

Although there are many new features that can be used to deter counterfeiters, the BEP should continue to utilize fine-line engraving, intaglio printing on high-quality pale-tinted paper, and the security thread as methods of deterrence against "classical" printing technologies and present-day reprographics. Future banknote designs should also incorporate additional visible features to serve as deterrents against counterfeiting and as a means for rapid visual authentication. If analysis shows it is cost effective to do so, some of these overt features could be incorporated into a banknote and their existence not publicly disclosed until they are needed to thwart a new counterfeiting threat.

The BEP should implement a system of complementary features on each banknote that create added complexity for simulation by all levels of counterfeiters. They should not, however, constrain their design by a requirement that the same set of counterfeit deterrence features be on all denominations of bills. And although multiple features rather than a single dominant feature should be present on each banknote, the number of announced features

should not be so great that it overwhelms the user or does not allow space for future feature incorporation.

The BEP should redesign U. S. banknotes to include at least some of the features recommended below, making such changes in appearance as are necessary to produce a new series of notes that effectively and efficiently incorporates these advanced counterfeiting deterrents. The recommended features (discussed in detail in a subsequent chapter) fall into three categories: near term, intermediate term, and long term. Within the categories, the deterrent features are not prioritized because of insufficient data relating to implementation issues and the realization that no single feature is adequate protection from even casual counterfeiting.

The committee recommends (listed in alphabetical order) incorporation of at least some of the following visible features in the near term:

- color-shifting inks for printing;
- moiré (alias-generating) line structures, with color added as necessary to enhance the effect;
- security-thread modifications e.g., location or width based on the denomination;
- variable-size dot patterns, with color added to enhance the effect; and
- localized watermarks.

Incorporation of at least some of the following features, requiring inexpensive visual aids for detection at the point of sale, are recommended for the intermediate term:

- infrared inks for printing;
- optically active coated fibers and particles embedded in the substrate; and
- photoluminescent inks for printing.

Longer-term plans for advanced deterrents should include additional development and understanding of the following features:

- diffraction-based holograms and related devices;
- embedded zero-order diffraction gratings;
- laminated paper substrates with selected features;
- metallic or specular woven security features;
- optical fibers embedded in the substrate; and
- random pattern encryption methods.

For the far term, the BEP should continually assess fundamental advances in the chemical, applied physical, and biological sciences for developments that are applicable to innovative deterrent features. Assessment of research in psycho-physics would also be pertinent since a better understanding of how people perceive visible features may provide insight into the selection of the "best" features.

Before any new counterfeit-deterrent feature is implemented, it should be evaluated by adversary-analysis experts to determine how readily it can be defeated. This process would be aided by having a means to quickly produce currency with appropriate design changes.

There are other aspects of a counterfeit deterrent strategy that should be developed along with incorporating new features in banknotes. To begin with, counterfeit-detection education should be emphasized for point-of-sale persons as a priority, and it should be available for the public at large. Potential incentives that would encourage the public to turn in counterfeits should be closely studied to determine which would be effective and not subject

to abuse.

Industry should be encouraged to develop effective point-of-sale aids to assist in banknote authentication. Efforts that will lead to a high degree of authentication, particularly for the higher denomination bills, should be continued.

The Department of Treasury should investigate the cost effectiveness of requiring source identification (e.g., machine serial numbers) to be embedded in images produced by new copier and printer systems that are capable of producing quality color counterfeit banknotes. If it is determined to be cost effective, appropriate U.S. legislation requiring source identification should be encouraged. In addition, the Department of Treasury should strongly encourage the use of sensors built into color copier and printer systems that can recognize and inhibit banknote copying. For this approach to be most effective, a unique, feature with a high signal-to-noise ratio currency should be identified, developed, and applied universally to currency, possibly in conjunction with other nations. The application of this technology to lower-end systems, such as ink-jet printers, should be analyzed. Many of these printers do not now contain the sophisticated electronics necessary to implement this technology, and thus the inclusion of such technology would have a major cost impact. Also, it is unclear how easily these systems can be defeated by a determined, knowledgeable computer "hacker."

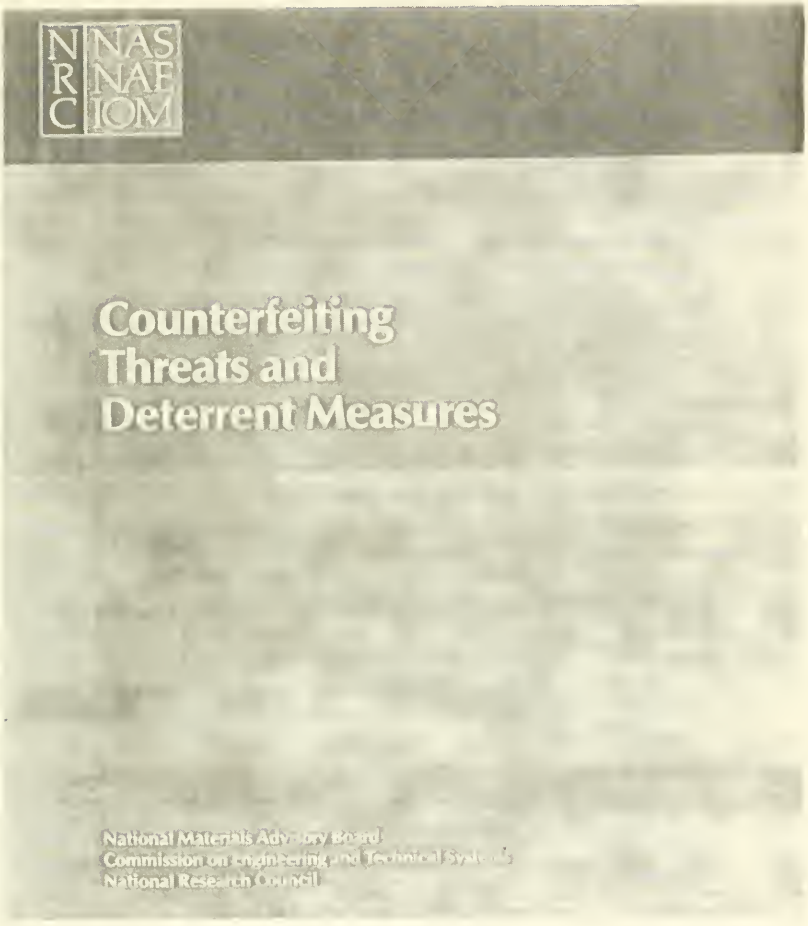
To stay ahead of the evolving counterfeiting threats, the Department of Treasury (perhaps led by the BEP) should establish a multiphased program of identifying and evaluating advancements in relevant technologies. Understanding the technological progress in non-impact printing technologies, and which counterfeiting techniques and methods are being employed, would help the Department of Treasury anticipate advances in the sophistication level of counterfeiters so that the type and timing of counterfeit deterrents could be planned accordingly. Appropriate mechanisms to accomplish this can take the form of advisory panels, committees, workshops, and briefings.

In order to link the science and technology research community with BEP needs, the same mechanisms suggested above for keeping up to date with reprographic technology would be appropriate. However, this is such a wide-ranging area that more in-depth preparatory work would be necessary. In order to make maximum use of information about scientific and technological advances in all relevant areas, there should be internal Department of Treasury technical activity to ensure comprehension and proper interpretation of these research reports.

The BEP should continue to reevaluate its current materials, process specifications, and tests against actual use requirements, taking into account that different use requirements may apply to different bill denominations. Correlation should be made between the different failure modes of currency experienced in practice and the suite of specification tests performed by the BEP.

Long-range systematic planning for incorporation of features should be instituted as a regular part of the mission within the Department of Treasury.

Finally, the Department of Treasury should continuously gather data from other nations as to the effectiveness and durability of features such as color-shifting inks and holograms that have been incorporated into their currency.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Counterfeiting
Threats and
Deterrent Measures
National Materials Advisory Board
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National Research Council

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EXECUTIVE SUMMARY

Technological advances in reprographic systems, based on electrophotography and other techniques, could result in widespread availability of high-quality image-copying equipment that requires no special skill to operate. The deterrents now used in U.S. currency will not be adequate to prevent counterfeiting with these systems. The potential illegal use of this equipment by amateur or "crime-of-opportunity" counterfeiters as well as by professional criminals is, therefore, a matter of concern to the Treasury Department and other agencies responsible for the integrity of the U.S. currency system.

Accessibility of the new reprographic systems in businesses throughout the country could give rise to a large number of "crime-of-opportunity" counterfeiters widely dispersed nationwide, each of whom could turn out relatively small numbers of bogus notes. The potentially large increase in counterfeiting along with the diffuse geographic distribution of the activity could saturate law enforcement resources and erode confidence in U.S. currency. This possibility was recognized by the Treasury Department and the Federal Reserve System several years ago, and studies, including one by the National Materials Advisory Board, were made to evaluate the seriousness of the threat and to explore the various deterrent measures that could be taken.

The primary function of the present study was to re-evaluate 17 different counterfeiting deterrents, many of which had shown promise in the previous NMAB study, in the light of new data and technology. As before, the principal criterion was effectiveness in causing counterfeit notes produced by advanced reprographic systems to be easily recognizable by the general public on simple inspection. Other important criteria were durability when used in currency, compatibility with the operations of the Bureau of Engraving and Printing, and cost. The deterrents judged most worthy of continued development are security threads; watermarks; other volume-related substrate modifications; variable dot-pattern-generated gray-scale printing; complex high-resolution design; and optically variable inks.

The first three deterrents, considered to be the most effective, are related in that they all exploit the three-dimensional properties of the substrate. The study concluded that this feature confers an inherent advantage over deterrent systems that use only surface features.

Watermarks and security threads are, however, the only currently available embodiments of this principle, and it is strongly recommended that other schemes be developed to exploit the three-dimensional nature of the substrate.

The three other types of deterrents, also considered effective, differ in concept, in the state of their development, and in their ability to cope with technological advances. Thus, variable-dot-pattern gray-scale printing, which would allow the encoding of words such as "VOID" to appear on a counterfeit, is already reliable; however, it will remain an effective deterrent only as long as the BEP's printing capability exceeds the resolution of new reprographic technologies and remains cost-effective. Complex design, including the use of microprint, can outrun the ability of the unaided eye to adequately discern specific details; it could thus shift the utility of the deterrent from the "man in the street" to the point of sale, where it is possible to employ some visual assistance. Optically variable inks can, in principle, produce dramatic visual effects such as those created by interference films without the attachment and durability problems associated with those decal-like devices. Further ink development is needed, however, to see if this potential can be realized in practice.

The present study also reiterated and endorsed the recommendations of the previous NMAB study that early action be taken to incorporate new anticounterfeiting deterrents in the currency and that more than one new deterrent be introduced, each based on a different principle. The present study concluded, also, that aesthetically acceptable modifications of the present currency design can be made that will allow incorporation of effective deterrents and that a public education program should accompany the introduction of currency with new deterrent features.

I

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Recent studies have confirmed that rapid developments in reprographic technology could give rise to an unacceptable level of counterfeiting activity by making high-quality reprographic systems widely available. Besides aiding the operations of professional criminals, these systems could make possible the rise of new sources of counterfeiting: "crime-of-opportunity" counterfeiting practiced by amateurs and premeditated counterfeiting practiced by semiprofessional or petty criminals who until now have not had the skills or the equipment required to counterfeit. The total number of counterfeiting sources could be very large and widely distributed geographically, and the number of spurious notes produced by each source could be small, thus posing a major law-enforcement problem. The present traditional currency deterrents--special paper, elaborate portraiture and design, high-quality engraving, and intaglio printing--will not suffice to foil advanced reprographic systems, and new or additional deterrents must be employed. Early action is required to incorporate such deterrents in the currency because of the anticipated increasing availability of advanced reprographic systems; the time necessary for currency design, production, and stockpiling; and the need to inform the public about the nature and use of the new deterrents.

Incorporation of certain deterrents will require some modification of the design of the currency. It is clearly desirable to make as few design modifications as possible so as to preserve the special character and high aesthetic quality of U.S. currency. However, excessively narrow constraints on the redesign can unnecessarily preclude the use of some of the more effective deterrents. The committee believes that the character and aesthetics of American currency can be preserved despite the introduction of some nontraditional design features and that the public will find these changes acceptable after the need for them is understood.

Once currency redesign is undertaken to foil advanced reprographics, it is prudent to incorporate more than a single new deterrent--preferably deterrents based on different physical principles. The probability is small that new technological developments will appear that can negate simultaneously the effect of different types of deterrents.

Seventeen types of deterrents discussed in an earlier National Materials Advisory Board report were reassessed by the present committee in the light of recent technological advances. Of these, the types recommended not only produce easily recognizable gross differences between counterfeit and genuine currency but also have the practical advantages of ruggedness and low cost as well as requiring little further development.

Exploitation of the three-dimensional nature of the substrate can produce a class of deterrents of singular power to foil counterfeiting by any means of reproduction. Any copying or printing process, no matter how advanced or sophisticated, can transfer an image only to the surface of the counterfeit substrate; it cannot endow the volume of the counterfeit substrate with the volume-related properties of the genuine substrate. If the genuine note has a volume-related deterrent, such as a security thread or a watermark, it will be absent from the counterfeit note no matter how precisely the surface portraiture and other printed features are reproduced. Only if the counterfeiter starts with a substrate that contains these deterrents can they appear in the bogus note. Tight control of the substrate material is therefore necessary for this approach to be effective, but this is no different from the control now being exercised over the supply of U.S. currency paper. The exploitation of the volume properties of the substrate may completely eliminate the threat of amateur or "crime-of-opportunity" counterfeiting and greatly inhibit professional counterfeiting as well.

RECOMMENDATIONS

These recommendations are based on the committee's findings as discussed in the foregoing conclusions and detailed in subsequent chapters.

1. Changes of U.S. currency design* should be initiated at once to protect the U.S. public against the emergence of "crime-of-opportunity" counterfeiting as well as increased professional criminal counterfeiting that advanced reprographic methods could make possible.

2. Appreciable departures from traditional note design should not be ruled out a priori, lest the choice of counterfeiting deterrents be unnecessarily limited and the effectiveness of the action thereby be weakened.

3. The new currency should incorporate a combination of deterrents based on different technologies.

---

*The term "design" used throughout this report includes all aspects of appearance--portraiture, ink, watermarks, method of printing, etc.--as well as more subtle substrate modifications.

4. The following deterrents are recommended for further development because they have characteristics compatible with use in currency and, in principle, can produce gross differences, easily recognizable by an untrained observer, between genuine and reprographically attempted counterfeit currency. Most effective are security threads, watermarks, and volume-related substrate modifications. Next in effectiveness are variable dot-pattern-generated gray-scale printing and complex design. Optically variable inks would be less effective still.

5. Special emphasis should be given to the first three deterrents listed because of the advantages inherent in the use of the three-dimensional properties of the substrate.

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U.S. Currency: New Security Features

On July 25, 1991, the Department of the Treasury announced changes in paper currency that will make counterfeiting more difficult. We have enclosed several factsheets which answer some of the most frequently asked questions about these changes. More detailed information is available in a specially prepared packet, *Your Money Matters*, available to the public from the Bureau of Engraving and Printing, Public Affairs Office, 14th and C Streets SW, Washington, D.C. 20228. Phone (202) 874-3019.

Members of Congress desiring more information on this topic may call CRS at 7-5700.

Additional information, primarily in newspapers and periodicals, may be found in a local library through the use of such indexes as the *Readers' Guide to Periodical Literature*, *Magazine Index*, and the *New York Times Index*.

Congressional Reference
Division

TREASURY NEWS
Department of the Treasury • Washington, D.C. • Telephone 566-2041

EMBARGOED UNTIL
9:30 AM, EDT
July 25, 1991

CONTACT: Claire Buchan
(202) 566-8773

SECRETARY NICHOLAS BRADY ANNOUNCES SECURITY FEATURES TO SAFEGUARD U.S. CURRENCY

Treasury Secretary Nicholas F. Brady today announced two new features designed to protect U.S. currency against counterfeiting by advanced copier, scanner, and computer-based printer equipment.

"The introduction of these new features is well ahead of the widespread accessibility of advanced copier and printer technology," said Secretary Brady, "but we must be vigilant and continuously provide protection against emerging counterfeit threats. A secure currency is the foundation of the Nation's economy and important to every American. With over 50 percent of U.S. dollars held outside the country, security from counterfeiting is also essential to a sound global economy."

The Bureau of Engraving and Printing is now producing Series 1990 $100 notes with a security thread and microprinting. These will be closely followed by security-enhanced $50 notes. When the Federal Reserve System puts the Series 1990 $100 notes into circulation over the next few months, enhanced notes will slowly replace existing notes which will continue to circulate without recall. Enhanced $50 notes will be introduced in a similar manner.

Because the two security enhancements are almost invisible to the naked eye, U.S. currency will look much the same. But, they give the public and cash handlers two additional means of checking notes if they suspect a counterfeit. The security safeguards are:

Security thread: A polyester strip is embedded in the paper on the left side of the note's face in the clear field between the border and the Federal Reserve seal. The letters USA and the denomination (e.g. USA 100) are printed on the strip in an alternating up-and-down pattern. Easily seen when held to a light, the strip cannot be reproduced in the reflected light of copiers.

-more-

EMBARGOED UNTIL
July 25, 1991

United States Currency Security Features
Questions and Answers

Q. What changes are being made to U.S. currency?

A. Two subtle security features--a polyester thread and microprinting--are being added to U.S. currency to deter counterfeiting with advanced copiers and printers. The enhancements, which will augment existing security features, will be introduced first in Series 1990 $100 notes, followed closely by $50 notes.

The security thread is a polyester strip embedded in the paper on the left side of the note's face in the clear field between the border and the Federal Reserve seal. Depending upon value, it has USA 100 or USA 50 printed in an alternating up-and-down pattern. Easily seen when held to the light, it cannot be reproduced in the reflected light of copiers.

Microprinting features the words THE UNITED STATES OF AMERICA printed along the sides of the portrait. The letters, at six to seven thousandths of an inch, are too small to read without a magnifier or for advanced copier and printer reproduction. They look like a thin line to the naked eye.

Q. Why are these changes necessary?

A. Advanced color copiers, graphic computers, color laser scanners, and printers that permit high quality reproduction are expected to be widely available within a few years. This would have created a new counterfeiting threat to U.S. currency. But because we have developed the security enhancements well ahead of the widespread availability of this technology, we have full confidence in all American currency.

Q. Are these changes only to deter advanced copier or printer counterfeiters?

A. Yes. The security thread and the microprinting will provide extra protection to deter counterfeiting on easily-operated copier and printer equipment which is expected to soon be widely accessible in offices, copy centers, and printing operations. Professional counterfeiters will also be hindered by the difficult, costly, and time consuming task of producing genuine looking threaded paper or reproducing microprinted text. Existing security features still offer protection against other means of counterfeiting.

Q. Why were the security thread and microprinting chosen?

A. Numerous other devices, many of which are used successfully by countries with lower currency production and circulation demands, were evaluated. These included holograms, thin films, multiple defraction grating, metameric inks, watermarks, and color tints. After the criteria of effectiveness, cost, durability, and adaptability to the traditional design were applied, the security thread and microprinting were determined to be the most appropriate security devices for U.S. currency. This was confirmed in a comprehensive 1986 National Science Foundation study.

Q. How is the thread inserted in the note?

A. The security thread is inserted in the currency paper during the papermaking process. The vendor uses a highly innovative technique that was developed specifically to produce threaded paper which meets stringent Bureau of Engraving and Printing requirements. The U.S. security thread is unique in the world in that it is wider, the graphics are easy to read, and it is virtually invisible in the reflected light of copiers.

Q. Why will the new features only be in $100 and $50 notes?

A. The higher value notes are being introduced first because they naturally pose the greatest risk of loss from counterfeiting. The two notes also only amount to about four percent of yearly currency production, which allows for an easily-managed start-up of initial production and circulation.

Other notes will be introduced with the security features over the next five years, with the probable exception of $1 notes, which do not pose a great risk. The security thread will read USA FIVE, USA TEN, and USA TWENTY, depending upon the denomination.

Q. Which note will have the security thread added next?

A. Production of an enhanced Series 1990 $50 note is planned for late 1991. The $20 note is expected to have a security thread added next, probably within a year-and-a-half. The $20 note amounts to about 30 percent of the yearly currency production.

Q. Who pays for the costs associated with new security features?

A. The Bureau of Engraving and Printing is a customer-funded agency. It is reimbursed by the Federal Reserve System for the capital, research and development, and printing costs for currency production. The Bureau does not receive funds through the Congressional budget process and is not taxpayer funded.

Q. What good does the microprinting do if you can't read it?

A. The microprinting provides an additional way of authenticating a suspect note. It is a low-cost security feature in that once the printing plate has been engraved there are no additional costs. If there is concern about a note, a simple magnifying glass can help in further scrutiny.

Q. How long does currency usually stay in circulation?

A. In the normal system of currency replacement, the Federal Reserve estimates the following approximate life cycles:

$ 1	1 1/2 years
$ 5	1 1/4 years
$ 10	1 1/2 years
$ 20	2 years
$ 50	5 years
$ 100	8 1/2 years

(This is an estimated extrapolation based on 1990 Federal Reserve Board statistics on currency received from circulation, paid into circulation, and destroyed.)

Q. How much currency is in circulation worldwide?

A. According to the Department of the Treasury's Financial Management Service Quarterly Report of March 31, 1991, approximately $268 billion in U.S. currency is in circulation worldwide. Of that amount, some Federal Reserve researchers have estimated that $80 - $110 billion is supporting domestic spending and $110 - $160 is offshore or domestically held.

Your Money Matters...

new and existing security features for your dollars' protection

NEW FEATURES

TO DETER COUNTERFEITING WITH ADVANCED COPIERS, SCANNERS, AND PRINTERS.

SECURITY THREAD

Embedded polyester strip with repeated USA 50 or USA 100 in an up-and-down pattern. Visible when held to light. Cannot be reproduced in reflected light of copiers. In new Series 1990 $50 and $100 notes.

MICROPRINTING

"The United States of America" printed repeatedly on sides of portrait. Letters too small to read without a magnifier or for distinct copier reproduction. In new Series 1990 $50 and $100 notes.

FEDERAL RESERVE SEAL

Issuing Federal Reserve Bank. Code letter same as first letter in two serial numbers.

PORTRAIT

Lifelike portrait distinct from fine, screenlike background.

ENGRAVED PRINTING

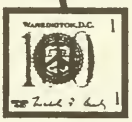
Engraved plate printing gives new notes embossed "feel."

SERIAL NUMBERS

Two serial numbers distinctively styled and evenly spaced. Ink color same as Treasury seal. No two notes of same series and denomination have same serial number.

TREASURY SEAL

Sawtooth points sharp, distinct, and unbroken. Seal's color same as two serial numbers.



PAPER

Cotton and linen rag paper has strong, pliable "feel." No watermarks.

BORDER

Border's fine lines and lacy, webbike design distinct and unbroken.

FIBERS

Tiny red and blue fibers embedded in paper.

DENOMINATION

Note's value on corners same as over Treasury seal.

If you suspect a counterfeit, call the police or U.S. Secret Service. Put the bill in an envelope and note person's description.

ENHANCED AND EXISTING NOTES WILL CO-CIRCULATE. NO RECALL IS PLANNED. REGARDLESS OF WHEN FIRST ISSUED, UNITED STATES AUTHORIZED CURRENCY REMAINS LEGAL TENDER.

BOARD OF GOVERNORS FEDERAL RESERVE SYSTEM

OFFICE OF THE TREASURER OF THE UNITED STATES

DEPARTMENT OF THE TREASURY BUREAU OF ENGRAVING AND PRINTING

Watermarks: Watermarks applied during the paper manufacturing process produce a distinct design that can be seen in transmitted light. This security feature, common in other world currencies, would require a complete redesign to give sufficient clear space for U.S. currency effectiveness.

Latent Image: An image is created by multidirection engraved lines that are visible when viewed at a specific angle. Effectiveness is based on the three-dimensional effect of intaglio printing. The device rapidly degraded and was difficult to detect after simulated U.S. currency circulation.

Background Color Tints: Complex color tints (rainbow tints) are commonly used in security documents to provide subtle, difficult-to-produce color gradations. Useful against older copiers and photographic reproduction equipment, the tints were not as effective against advanced copiers or scanners. A redesign would be required to successfully utilize this type of deterrent in U.S. currency.

Metameric Pairs: Two inks, appearing the same color under normal light, appear different under intense copier and scanner lights. Copies show color differences. Some foreign currencies have this feature. For U.S. currency, a significant redesign would be required to provide the large area of metameric colors necessary for effectiveness.

Security Threads: Several variations of security threads were evaluated, such as windowed, solid, and denominated. These devices have a continuous filament or ribbon embedded into the base paper during manufacture. They can also be manufactured with identifying information, such as the denomination.

The security thread determined to be the most effective counterfeit deterrent for U.S. currency is visible when held to the light and invisible in the reflected light of copiers or scanners. It is durable, cost effective, and can be incorporated into the traditional design.

Microprinting: Text is printed too small (6 to 7 thousandths of an inch) to be accurately copied by reprographic equipment. Microprinting is inexpensive, durable, and can be incorporated into the current U.S. currency design. After the original engraving, it is reproduced as part of the normal printing operation.

# # #

Your Money Matters... **FACT SHEET**

ADVANCED COPIER AND PRINTER TECHNOLOGY

Advanced copier and printer technology improved dramatically during the 1980s and is expected to continue to mature during the remainder of the 20th century. Some of this equipment is capable of accurately reproducing the colors and fine line detail of security documents and is seen as a threat to United States currency.

Market surveys indicate that as quality, affordability, and availability increase, advanced equipment will become the standard in offices, copy centers, and printing facilities. Industry analysts forecast that up to 1.7 million color copiers and 1.8 million color printers will be in use by the end of 1994. The color copier of the '90s has been compared to the color television of the '70s, when color became the standard rather than the exception.

Of the new technologies, advanced copiers, electronic scanners, and color workstations are the primary threats to currency. They do not require extensive expertise to operate and are expected to become widely accessible. Of these, only about 30 percent pose a serious threat because of high quality, high resolution capabilities.

ADVANCED COLOR COPIERS

There are two types of advanced color copiers: analog or optical imaging systems and digital imaging systems. Analog imaging systems scan the image optically and directly or indirectly make an image on paper. These systems include photographic, electrophotographic, and Cycolor. Digital imaging systems optically scan an image and convert it by computer into digital signals used to make an image on paper. Digital systems include thermal transfer, ink jet, and also an advanced electrophotographic.

Photographic—(Analog/optical)

Photographic based color copiers at under $20,000 offer exceptionally high quality reproductions using photographic paper. This technology, even with improvements for less specialized use, is not a threat to security documents since copies are readily identifiable by the special photographic paper.

Cycolor—(Analog/optical)

This light activated analog imaging technology has a unique process using microencapsulated primary color dyes. The color copier is relatively inexpensive at under $10,000. The color quality is considered good, but the special paper requirements reduce the threat to currency security.

Thermal Transfer—(Digital)

Color thermal copiers, usually associated with computer digital printers, are priced around $10,000. The copiers produce shiny, waxy copies in the lower quality range and are not viewed as a major counterfeit threat.

Color Ink Jet—(Digital)

Designed for the engineering/scientific area, this technology is capable of making good quality, oversize copies at 400 dots-per-inch with plain paper copying. Priced at approximately $95,000, it is not widely available and does not pose a current risk to currency security.

(more)

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SCIENCE
NUMISMATICS

High-Tech Greenback Designed to Foil Photocopy Counterfeiters

By Malcolm Gladwell
Washington Post Staff Writer

Shay Schmidt committed his crime on his dad's color photocopier. There, taking advantage of the very latest in copying technology, he and his buddy Jack Williams ran off $15,000 worth of $20 bills and then did what seemed natural with pockets full of free cash. They went shopping.

The two Wichita teenagers eventually were nabbed trying to pass a bogus $20 bill at a garage sale. But their escapade is just one of thousands that have taken greenback counterfeiting to record heights, posing an unprecedented threat to the U.S. currency.

The culprit is not just the rise of sophisticated color copiers, which have made astonishingly convincing forgeries possible at the touch of a button, but also the antiquated design of American money, which contains none of the many new anti-counterfeiting techniques that have been adopted by other countries.

Canada has a high-tech patch that changes colors on its new $20 bill and that cannot be photocopied or easily duplicated. Britain has a thick, metallic thread running through its £20 note.

Australia has been experimenting with holograms and plastic film instead of paper. Other countries vary the sizes of different denominations and use exotic types of paper.

But the United States? Because of the standardized design of American bank notes, some counterfeiters have taken to bleaching $1 bills and printing $20 notes over the paper, a technique that has produced bills that not only look like real money but also have the dollar's grainy feel.

"It used to be that if someone wanted to do a decent job of counterfeiting, they had to have a certain skill in printing technology," said Dave Robbins, an anti-counterfeiting expert at Battelle Laboratories in Ohio. "They had to know how to make an offset plate. Now all the skill's been taken out of it."

U.S. Treasury Plans Countermeasures

According to the Treasury Department, this problem will not last forever. By the early 1990s, all bills will have the words "United States of America" printed around the presidential portraits in letters too small to be picked up by even the best copying machines. To foil the bleachers, the bills will also have a special polyester thread running from top to bottom just to the left of the portrait. Because the thread will have the denomination of the bill written on it, it will be foolish to simply bleach a $1 bill into a $20 bill. And because the thread is visible only when the bill is held up to the light, it cannot be reproduced by a photocopier.

But because the Treasury is reluctant to change either the style or the color of the traditional greenback, its proposed changes are relatively modest and have been critized by some currency experts as unlikely to deter anyone but the casual counterfeiter, who usually gets caught anyway. Working with the latest in printing and design technologies, a number of currency specialists have instead proposed junking the greenback entirely in favor of a dramatic redesign of U.S. money that includes not just microprinting and security threads but a whole grab bag of printing gadgetry and high-tech devices.

"There is nothing that can't be beat by someone," said Bob Leuver, former head of the Bureau of Engraving and Printing. "What you want to do is put a multitude of these devices in to make life difficult for the professional. You want to make it so that it can't be done in an hour."

Take the question of design. The most difficult parts of the U.S. currency to forge or to duplicate accurately—even on a color copier—are the portrait and the seal. Yet because all U.S. money shares the same color and style, most people distinguish bills by looking at the least problematic part of a counterfeit bill: the numerals in the corners.

This, say many counterfeiting experts, is the single greatest obstacle facing the battle against bogus bills. Most people who receive money do not look at it in such a way as to be able to tell the difference between what is real and what is not.

Although the changes proposed by Treasury make detection by experts easy, critics say, they do not solve the problem of everyday use. The microprinting around the portraits, for example, is not only too small to be read by a copier, it is also too small to be read by the naked eye. Nor can the the so-called "security thread," which is visible only in transmitted light, be seen without a special effort.

The "ideal" American bank note would be a little more dramatic, the experts say.

Among the proposals:

■ COLOR: The best way to reduce the focus on corner numbers would be to assign each denomination a different color. That, the theory goes, would get store clerks to look at the whole bill. Then the portrait could be enlarged or set off with special graphics to make it the center of attention.

The trick here is not just to use any kind of color graphics, which can, of course, be duplicated by a sophisticated color copier. But certain kinds of inks can cause unusual visual effects that cannot be picked up by a machine. What is known as front-to-back reproduction, for example, means that color on one side of a bill would shine through and illuminate designs on the other side. For example, a blue tint on the back of the $5 bill might shine through Abraham Lincoln's eyes on the front.

Other specialized inks give what is known as an iridescent effect, changing colors as the viewing angle changes like a film of oil on a water puddle.

■ OPTICAL VARIABLE DEVICES: This is essentially high-tech printing, which attempts to make anti-counterfeiting measures so conspicuous that they can be spotted by even the most casual inspection.

In the upper left corner of the new Canadian $20 bill, for example, is a small, rectangular patch that changes color from gold to green when it is tilted under light. Composed of five alternating layers of extremely thin transparent silica and zirconia welded by an electron-beam gun, the device is extremely difficult for a counterfeiter to duplicate.

Along the same lines, the U.S. company that puts the holograms on credit cards has proposed putting them on bills as well. The process is also tricky, since on a flexible bank note—as opposed to a stiff credit card—a poorly constructed duplicate would crinkle like tin foil.

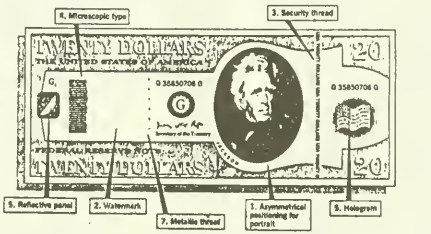
■ IMPROVED PAPER: One of the weaknesses of the current currency is that ordinary rag paper can pass for the 75 percent-cotton/25 percent linen nut used in U.S. bills. One alternative would be to supplement the security thread with some kind of highly visible weave. On the new British £20 note, for example, a thick metallic thread weaves up and down through the paper's thickness, surfacing on the front of the bill every quarter inch. It is not impossible to duplicate, but without the exact paper, a would-be forger would have to paste thin strips of tin foil on the bogus bills one by one.

"Who's going to stay up all night doing that?" said Leuver.

■ CALL IN THE BIG BILLS: This, the most ambitious anti-counterfeiting measure, is premised on the fact that most counterfeits are of large-denomination bills, $20s, $50s and larger. Since credit cards and checks are used more commonly for these amounts anyway, simply ending the use of all big bills would relegate forgers to counterfeiting smaller denominations, a decidedly less cost-effective prospect for big-time criminals.

RIGHT ON THE MONEY

In recent years high-quality offset printing and sophisticated color copiers have made it easier to counterfeit money. Here are some of the preventive measures engineers have developed to cope with the new threats.



1. Put numerals indicating denomination at one and only and put the portrait near them. This draws the eye to the portrait, which is the hardest part to counterfeit. Because most people check the numerals, not the words, to verify the denomination, they are more likely to see flaws in a faked portrait.

2. Add a watermark, produced by compressing the paper with a die to leave a design or picture that can be seen only by holding the bill up to the light. A watermark needs an area of white space.

3. Embed a "security thread," or ribbon, in the paper. Photocopiers cannot see it, but when bill is held up to the light, thread shows the denomination. This foils those who bleach $1 bills and print $20 on the same paper. U.S. bills may include this in the near future.

4. Print part of the design in microscopic type, too fine to be picked up by copiers or printers. Under a magnifying glass, counterfeit versions will appear blurred. U.S. bills are to introduce this.

5. Include some kind of "optical variable device" such as a hologram or reflective panel that changes color when viewed from changing angles. This fools photocopiers and is difficult and costly to increase. Credit cards and some foreign bills have these.

6. Coordinate front and back designs so that when held up to the light, the two combine to recreate a complete picture. For example, a black-and-white outline on one side could be filled in by color on the other side.

7. Weave a metallic thread up and down through the paper's thickness so that it is visible at intervals on each side.

BY PETER HOEY—THE WASHINGTON POST

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CRS Report for Congress No. 87-301 E

REDESIGN OF THE U.S. CURRENCY

For nearly a decade the Bureau of Engraving and Printing, U.S. Secret Service, and the Federal Reserve considered changing the design of U.S. currency because of the potential threat of counterfeiting by photocopying machines. Technological advances have enabled photocopiers to produce high quality color reproductions. On March 18, 1986, changes in the design of U.S. currency were announced. These changes will be implemented shortly.

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by
Pauline Smale
Economic Analyst
Economics Division

Congressional Research Service
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REDESIGN OF THE U.S. CURRENCY

On March 18, 1986, changes in the design of U.S. currency were announced. The decision to alter the currency was reached because of the potential threat of counterfeiting by photocopying machines. Experts in the printing industry predicted that by the early 1990s color copiers will pose a serious threat for crime of opportunity counterfeiting of U.S. currency. The new bills are expected to go into circulation within 15 to 18 months from the announcement date.

The Secretary of the Treasury has the authority to determine the form and tenor of the U.S. currency without congressional approval. In 1983, Treasury representatives met with the Banking Committees to discuss the reasons behind a need for a change in the U.S. currency. Congressional interest in overseeing any alterations developed as a result. Legislation requiring congressional approval of any Treasury altercation of the currency was introduced in both the 98th and 99th Congresses. Hearings were held by the Subcommittee on Consumer Affairs and Coinage of the House Banking Committee in July 1984 and June 1985. On July 15, 1985, H.R. 48 was passed by the House. An identical Senate bill, S. 1123, was introduced on May 10, 1985. Hearings were not held on S. 1123.

BACKGROUND

It became apparent in the 1970s that technological advances in color print photocopying would eventually facilitate counterfeiting of U.S. currency. Currently, it is expected that by 1992 photocopiers capable of high quality color reproductions will be commonplace. Federal agencies responsible for the safety of the U.S. currency were concerned that counterfeiting would no longer be a crime of expertise and that the public's confidence in the currency could be seriously eroded. At present, the skills involved in quality counterfeiting have helped contain the crime. Over the last 10 years the Secret Service estimates that it has been able to seize 90 percent of all counterfeit currency prior to circulation. The color photocopiers could change this situation by allowing counterfeiting to become widespread and decentralized.

In 1981, the Secretary of the Treasury established a committee to study the potential threat to the U.S. currency and to advise him on redesign approaches. The Interagency Steering Committee on Advanced Counterfeit Deterrence was chaired by the Treasurer of the United States and the members are representatives from the Federal Reserve System, the Secret Service and the Bureau of Engraving and Printing.

and Printing printed 6.2 billion notes in FY85. There were approximately 27,156,300,000 notes in circulation at year end 1986.

REMAINING CONCRESSIONAL CONCERN

Interest in congressional oversight of any changes in the U.S. currency was heightened by constituent concern. Media attention to possible changes in the currency brought public reaction. Misinformation was circulated about the alterations and the future value of existing currency. Confidence in the Nation's currency reflects on the public's feelings toward the economy and the strength of the country in general, so it is important to protect this confidence.

Proponents of congressional oversight feel it is needed to confirm whether the goals behind the changes are met and to assure the public that the U.S. economy is secure. Four major goals should be taken into consideration: deterrent capability, feasibility, cost-effectiveness, and acceptability. Some feel that the Treasury's behind-the-scenes approach to redesigning the currency has encouraged a misleading aura of secrecy which could undermine the public's confidence in U.S. currency. Additional concern was voiced after the changes were announced. Critics feel the changes are so subtle that they will go unnoticed by the average individual and therefore will not be effective.

Spokesman from the agencies represented on the Steering Committee have stated that the Treasury approached the currency change carefully so as not to alarm the public. When counterfeiting by photocopiers was recognized as a potential threat to the U.S. currency, the Committee was established to undertake a thorough study and to make recommendations. It was expected that announcing the changes 15 to 18 months before their implementation would allow time to educate and reassure the public before the notes are in circulation.

Treasury representatives feel the research performed provided recommendations which will be effective and acceptable to the public. A major objection to using the legislative process is the amount of time that might be involved. The concern is that the photocopiers capable of counterfeiting could be widespread operation before legislation is passed and the alterations implemented.

rb

SAVE THE GREENBACK

1000 THOMAS JEFFERSON STREET, N.W.
SUITE 609, GEORGETOWN
WASHINGTON, D.C. 20007
(202) 342-3342 FAX (202) 298-7810

DAN BRADLEY
CHAIRMAN

MICHAEL J. REMINGTON
PRESIDENT

KATE LEONARD
EXECUTIVE DIRECTOR &
TREASURER

RUSS WAPENSKY
SECRETARY

July 7, 1994

Tristan,

Enclosed is the statement and backup documentation (3 copies) we would like to introduce into the record at the July 13th hearing. We've sent the original to Bentsen. Please call if you have questions. Incidentally, we will be hosting a luncheon on counterfeiting for interested Hill staffers at noon, July 15 at the Monocle. Haim Bretler, an internationally recognized expert in counterfeiting deterrence will be the featured speaker. If you would like to attend, please give me a call.

Thanks,

Russ Wapensky

"SAVE THE GREENBACK" IS A TRADE NAME OF SAVE THE GREENBACK ASSOCIATION

SICPA

SICPA Industries of America

Office of the Chairman
1000 Thomas Jefferson Street, N.W.
Suite 609, Georgetown
Washington, D.C. 20007
Telephone: 202 342 3342
Telefax: 202 298 7810

July 6, 1994

Honorable Lloyd Bentsen
Secretary
Department of the Treasury
15th & Pennsylvania Avenue
Washington DC 20220

Dear Mr. Secretary:

I write to you as Chairman of SICPA Industries of America, Inc., (SICPA) the manufacturer and supplier of ink used by the Bureau of Engraving and Printing (BEP). The BEP uses our inks to print the United States currency. This ink is produced by SICPA's subsidiary, SICPA Securink Corporation, which has manufacturing facilities in Springfield, Virginia and Fort Worth, Texas.

This letter relates to the July 13th hearing before the Committee On Banking, Finance and Urban Affairs of the House of Representatives. We have been working with Members and Staff of this and other Committees and Subcommittees of the House and Senate to familiarize them with Optically Variable Ink (OVItm) and its application as an effective OVERT anti-counterfeiting device. We have been asked to brief Members and Staff in preparation for the hearing and will provide you and your staff with information relating to OVItm.

SICPA is a world-wide organization that sells security inks to more than 150 countries. It supplies currency inks to most of the world's governments. OVItm is produced by SICPA in the United States and is recognized world-wide as an effective international counterfeiting deterrent. Twenty one countries (including our major trading partners) currently use OVItm in their currency, with eleven others planning to introduce it on their notes in the near future. Numerous banknote printers around the world are using it on value documents. See attached listing.

You are already familiar with the substantial increase in offshore counterfeiting and the deleterious impact that it is having on United States currency both here and abroad. There is also the continuing problem of counterfeiting within the United States. This has been exacerbated through the use of high definition color copiers and computer enhanced design capabilities. OVItm is the only effective and visible system of deterring both the sophisticated counterfeiter and the amateur forger from illegally reproducing our currency.

In 1992, the Treasury Department requested the National Research Council (NRC) to analyze and recommend overt security features that could be incorporated into American currency in order to enhance the counterfeit deterrence capability of our notes. The NRC, through its National Materials Advisory Board, appointed a Committee on Next-Generation Currency Design (Committee). The report of the Committee, "Counterfeit Deterrent Features For The Next-Generation Currency Design" (the Report), was issued last year. I have attached a copy of a few pages from the Committee's report showing the membership and a listing of some of the resource people upon whom the Committee relied for technical assistance.

This is not the first time the Treasury has used the NRC for such a study. As early as 1863, the National Academy of Sciences provided advice to the Treasury Department, and such assistance has continued as recently as 1987.

SICPA has worked closely with the Committee during the course of its study by providing technical assistance. Note the enclosed listing includes Haim Bretler, Managing Director of SICPA Holding, SA, Switzerland. Mr. Bretler is recognized worldwide as an expert in the use of inks as counterfeit deterrents and has worked closely with key members of your Department. I have enclosed his biography.

SICPA has provided technical assistance to the BEP for many years and has worked closely on anti-counterfeiting measures with other agencies of the Federal Government. It is not an exaggeration to say that SICPA is an acknowledged world leader in the area of value documents and anti-counterfeiting.

SICPA has the exclusive right to manufacture OVItm which has been assessed by the Committee to be effective as an OVERT anti-counterfeiting device (see pages 55-58 of the enclosed Report). A small amount of OVItm is applied to the face of the bill, which causes a color shift, and is easily identifiable by a bank teller, grocery store clerk or other person handling the currency. This incidentally is a major problem with our currency, i.e., the average person who has a daily need to handle money, has no effective way of identifying bogus bills. OVItm provides the means in a quick and efficient manner that does not require the teller or clerk to be embarrassed by questioning the customer's proffered bill.

We have been informed that a working committee composed of representatives of Treasury Department agencies and the Federal Reserve, i.e., the Anti-Counterfeiting Design Committee (ACD) has made recommendations to you based on the Report, and that OVItm is among such recommendations. We also understand that you will be seeking the advice of key members of the House and Senate with

respect to these recommendations and that the July 13th hearing would provide a favorable environment to exchange views.

Mr. Secretary, I would appreciate the opportunity to discuss this matter with you in advance of the hearing as I believe it is one of utmost importance to the United States. I would be able to exhibit how OVItm is being used on the currency of other countries and I know that SICPA has the product that can be effective in the counterfeit deterrence effort which should be incorporated into any change in the currency for the following reasons:

1. The credibility of OVItm is undisputed. It has been adopted and accepted by numerous countries around the world. See list attached for countries using OVItm as of June 22, 1994. SICPA is currently producing OVItm at its Springfield, Virginia, plant for the Banknote Corporation of America for application on American visas at the direction of the State Department.

2. OVItm cannot be replicated, reproduced or otherwise counterfeited as SICPA is the only source of supply for this product. Theft or other attempts to invade the security of the production process can be interdicted and the security and availability of the supply of OVItm can be assured. The underlying product is produced in the United States and the ink itself is unique and produced for the Treasury Department at SICPA's facility in Springfield, Virginia.

3. The BEP reports that it charges the Federal Reserve about 4 Cents per note on average. The cost to add OVItm would be approximately 0.5 cents, thus it is highly cost effective.[1]

4. The product has been successfully tested on U.S. currency and is available immediately.

5. OVItm has been recommended by the experts who must deal with counterfeiting from an enforcement perspective and commercial interests that must bear the costs of counterfeiting.

6. The BEP does not need to purchase any additional equipment to add OVItm to the U.S. notes.

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[1] See August 27, 1993 Memorandum For Secretary Bentsen from Edwin A. Verberg, Deputy Chief Financial Officer, Department of the Treasury, "Subject: Chief Financial Officers Annual Report"

Additionally, Congressman Steny Hoyer's Treasury, Postal Service and General Government Subcommittee has looked at OVItm as well as other issues relating to counterfeiting. I believe a copy of his Subcommittee's report is available.

In 1991 Treasury added two features to our currency. The first is a printed mylar (security) thread added to the paper substrate which reads "USA" and the notes dollar denomination. If you hold a new twenty dollar bill up to a light source you may be able to see this strip running from top to bottom just to the left side of the Federal Reserve Seal.

The second is microprinting in the third layer of print around the portrait which says, "Unites State of America". Even with the use of a magnifying glass, one cannot read the print.

The point is, these are not really the kind of OVERT features that are helpful to a bank teller, a supermarket clerk or any other person responsible for the acceptance of our currency and chargeable for counterfeits. When you compare these invisible features to OVItm, there is simply no contest.

It has also been suggested that OVItm can be replaced by using "planchettes". That is not a viable option, given that planchettes are easily replicated. See enclosed paper. Planchettes, in short, would be of little assistance in thwarting the experienced counterfeiter.

I believe an examination of OVItm would be beneficial in your preparation for the hearing and in your review of counterfeit deterrence techniques for American currency. If you would like additional information, I would be pleased to provide it to you. I believe that you will find the unique OVItm technology to be ideally suited to your efforts to combat counterfeiting of our currency.

Sincerely,

Jerris Leonard

cc: Mr. Edward S. Knight

SICPA
DIVISION ENCRES FIDUCIAIRES

STATUS OF OVI TM

APPLICATIONS ON CURRENCIES

(as at June 22, 1994)

* Added as of June 22, 1994

STATUS OF OVI™ APPLICATIONS ON CURRENCIES

Countries currently using OVI:	Denomination:
- ARGENTINA	500, 1'000, 5'000 Australes 20, 50, 100 Pesos
- BELGIUM	2'000, 10'000 FB
- BERMUDA	100 $
- CZECH REPUBLIC	5'000 KC
- FRANCE	50 FF
- GERMANY	500, 1'000 DM
- ITALY	50'000 Lira
- KAZAKHSTAN	100, 200 Tenge
- KENYA	500 Shilling
* - LUXEMBOURG	5'000 Francs
- MOROCCO	200 Dirham
- NIGERIA	50 Naira
- PHILIPPINES	1'000 Pisos
- POLAND	2'000'000 Zloty
- SINGAPORE	500 $
- SLOVAKIA	1'000 SK
- THAILAND	60 Baht, commemorative note
- TUNISIA	20 Dinars
- TURKEY	100'000, 250'000, 500'000 TL
- UNITED ARAB EMIRATES	100 Dirham
- ZAIRE	5'000 Zaire

Countries introducing OVI on their notes in the near future:

- AUSTRIA	1'000 Schilling
* - EL SALVADOR	100, 500 Colones
- FRANCE	20, 100, 200, 500 FF
- ITALY	100'000 Lira
- LEBANON	New Series
- NIGERIA	100 Naira
- RUSSIA	New Series
- SWITZERLAND	10, 20, 50, 100, 200, 1'000 SFr
- TURKEY	1'000'000 TL
- UZBEKISTAN	New Series
- VIETNAM	100'000 Dong

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LIST OF BANKNOTE PRINTERS USING

S I C P A
SECURITY INKS

(as at June 6, 1994)

EUROPE- (1)

- AB TUMBA BRUK	Tumba	Sweden
- AUSTRIAN NATIONAL BANK	Vienna	Austria
- BANCA D'ITALIA	Rome	Italy
- BANKNOTE PRINTING CORP.	Budapest	Hungary
- BANK OF ENGLAND	Loughton	U.K.
- BANK OF GREECE	Athens	Greece
BANK OF YUGOSLAVIA	Belgrade	Yugoslavia
- BANQUE DE FRANCE	Paris	France
- BANQUE NATIONALE DE BELGIQUE	Brussels	Belgium
- BANQUE NATIONALE DE ROUMANIE	Bucarest	Rumania
- BUNDESDRUCKEREI	Berlin	Germany
- CALCOGRAFIA E CARTEVALORI	Milan	Italy
- CENTRAL BANK OF IRELAND	Dublin	Ireland
- DENMARKS NATIONAL BANK	Copenhagen	Denmark
- FABRICA NATIONAL DE MONEDA Y TIMBRE	Madrid	Spain
- GIESECKE und DEVRIENT GmbH	Munich Liepzig	Germany
- GOZNAK OF RUSSIAN FEDERATION	Moscow Perm	Russia
- HARRISON & SONS	High Wycombe	UK
- ISTITUTO POLIGRAFICO DELLO STATO	Rome	Italy
- JOH. ENSCHEDE EN ZONEN	Haarlem	The Netherlands
- NATIONAL BANK OF MACEDONIA	Skopje	Macedonia
- NATIONAL BANK OF UKRAINE	Kiev	Ukraine
- NORGES BANKS SEDDELTRYKKERI	Oslo	Norway
- OBERTHUR	Rennes	France
- ORELL FUESSLI AG	Zurich	Switzerland
- PANSTWOWA WYTWORNIA PAPIEROW WARTOSCIOWYCH	Warsaw	Poland
- SETEC OY	Vantaa	Finland

(EUROPE - continued) (2)

- STATNI TISKARNA CENIN	Prague	Czech Republic
- STATE BANK OF ALBANIA	Tirana	Albania
- THOMAS DE LA RUE GROUP		Hong Kong, Kenya, Malta, Singapore, Sri-Lanka, United Kingdom

AFRICA and MIDDLE EAST-

- BANQUE D'ALGERIE	Algiers	Algeria
- BANQUE DU MAROC	Rabat	Morocco
- CENTRAL BANK OF EGYPT	Cairo	Egypt
- CENTRAL BANK OF TURKEY	Ankara	Turkey
- NIGERIA SECURITY PRINTING & MINTING COMPANY	Lagos	Nigeria
- SUDAN CURRENCY PRINTING PRESS	Khartoum	Sudan

NORTH & SOUTH AMERICA-

- AMERICAN BANK NOTE CO.	Horsham, Penns. Chicago, Ill.	USA
- BANCO DE LA REPUBLICA	Bogota	Colombia
- BANCO DE MEXICO	Mexico City	Mexico
- BRITISH AMERICAN BANKNOTE	Ottawa	Canada
- BUREAU OF ENGRAVING & PRINTING	Washington D.C. Forth Worth, Tx.	USA
- CANADIAN BANKNOTE COMPANY	Ottawa	Canada
- CASA DA MOEDA DO BRASIL	Rio de Janeiro	Brazil
- CASA DE MONEDA DE ARGENTINA	Buenos Aires	Argentina
- CASA DE MONEDA DE CHILE	Santiago de Chile	Chile
- CASA DE MONEDA DE ECUADOR	Quito	Ecuador
- CICCONE HNOS Y LIMA	Buenos Aires	Argentina

A S I A (3)

- BANGLADESH BANK	Dhaka	Bangladesh
- BANK NOTE PRESS	Dewas	India
- BANK OF THAILAND	Bangkok	Thailand
- CENTRAL BANK OF DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA	Pyongyang	D.P.R. of Korea
- CENTRAL BANK OF THE PHILIPPINES	Quezon City	Philippines
- CENTRAL BANK OF THE REPUBLIC OF UZBEKISTAN	Tashkent	Uzbekistan
- CHINA ENGRAVINGS & PRINTING WORKS	Taipei	Taiwan
- CHINA MODERN PRINTING CORP.	Beijing Shanghai	China
- CURRENCY NOTE PRESS	Nasik Road	India
- NATIONAL BANK OF THE REPUBLIC OF KAZACHSTAN	Alma-Ata	Kazachstan
- PAKISTAN SECURITY PRINTING CO.	Karachi	Pakistan
- PERUM PERURI	Djakarta	Indonesia
- RESERVE BANK OF AUSTRALIA	Craigieburn	Australia
- SECURITY PRINTING & MINTING ORGANIZATION	Teheran	Iran
- STATE BANK OF VIETNAM	Hanoi	Vietnam

BIOGRAPHICAL NOTICE

HAIM BRETLER

Name: **BRETLER**
First name: **Haim**
Nationality. **Swiss**

Born in 1928 (in former Yugoslavia) to a family of printers and printing ink manufacturers.

After World War II, spent in captivity in Italy, emigrated to Israel, where he completed his education.

Graduated from Technion - Israel Institute of Technology as a Chemical Engineer and M.Sc. cum laude in nuclear chemistry.

After a brief spell teaching physical and nuclear chemistry, dedicated his whole professional activity to the printing ink field, first in Israel as Head of Laboratory and later Technical Director of Israel's largest printing ink company, then joined SICPA in Lausanne, Switzerland, in 1962.

Technical Director of SICPA Italiana S.p.A., Milan, Italy, from **1962 to 1964**.

Various responsibilities at the SICPA headquarter's plant in Lausanne, Switzerland, including research, formulation and manufacturing of all types of printing inks.

As of 1966 - 67, activity mainly dedicated to security printing inks for banknotes and other high value documents. As Technical Director of the SICPA Security Inks Division participated or lead all the main development projects in security inks, in collaboration with banknote printing machinery manufacturers and a number of security printers:

- **Modernization of intaglio ink formulations.**
- **Systematization of chemical and physical characteristics of security inks.**
- **Creation of the so-called water-wiping technology.**
- **Creation of stackable intaglio inks for multicolour printing.**
- **OVI™**

Lectured widely to selected and specialized audiences on requirements and applications of security printing inks.

Also, responsible for the **SICPA Engineering Division**. Helped establishing several SICPA plants for manufacturing of security printing inks.

From 1990 until retirement from line activity in 1992:
Managing Director of the Security Inks Division with worldwide contacts with Security Printing Institutes.

Since 1992:
Member of the Board of Management of the SICPA Group, SICPA Holding S.A.
Director General of SICPATEC International S.A. in charge of coordination of all technical activities of the SICPA Group
Member of the Board of SICPA Industries of America, Inc.
Member of the Board of SICPA México S.A. de C.V., Toluca, Mexico
Member of the Board of FIDINK S.A., Switzerland

PERSONAL

Married to **Lydia Bretler**, also a chemical engineer with a career of work in research and teaching.

Three adult **children**:
Naomi, a journalist
Gil, a biologist
Marc, a student in architecture

Hobbies:
Classical music, collection of banknotes, reading historical and contemporary novels.
At the present time, writing an autobiography.

COUNTERFEIT DETERRENT FEATURES FOR THE NEXT-GENERATION CURRENCY DESIGN

Committee on
Next-Generation Currency Design

National Materials Advisory Board
Commission on Engineering and Technical Systems
National Research Council

Publication NMAB-472
National Academy Press
1993

COMMITTEE ON NEXT-GENERATION CURRENCY DESIGN

GLENN T. SINCERBOX Chair, IBM Research Division, Almaden Research Center, San Jose, California
STEVEN ANDRIOLE, Drexel University, Philadelphia, Pennsylvania
NORBERT S. BAER, New York University, New York, New York
DONALD BAUDER, Sandia National Laboratory (Retired), Albuquerque, New Mexico
MITCHELL J. FEIGENBAUM, Rockefeller University, New York, New York
JOSEPH GAYNOR, Innovative Technology Associates, Ventura, California
STEVEN M. GEORGE, University of Colorado, Boulder
ANNETTE B. JAFFE, Apple Computer, Inc., Santa Clara, California
MICHAEL MORRIS, University of Rochester, Rochester, New York
KURT NASSAU, AT&T Bell Laboratories (retired); Nassau Consultants, Lebanon, New Jersey
ROBERT R. SHANNON, University of Arizona, Tucson
RODNEY SHAW, Consultant, Pittsford, New York

Liaison Representative

SARA CHURCH, Department of the Treasury, Bureau of Engraving and Printing, Washington, D.C.

National Materials Advisory Board

ROBERT E. SCHAFRIK, Director
ROBERT SPRAGUE, Consultant
JANICE M. PRISCO, Administrative Assistant, Project Assistant

ACKNOWLEDGMENTS

The committee is grateful to the many individuals who presented invited briefings on specific technical areas relevant to the production of banknotes, details of particular counterfeit deterrence features, reprographic technology, and the detection of counterfeit bills.

The committee acknowledges the following *industry* representatives:

Barney Barnes, Mars Electronics International: low technology bill validators

Haim Bretler, Director General, SICPA Holdings SA, Switzerland: overview of optical variable ink technology

Tim Crane, Crane & Co.: counterfeit deterrence features in banknote paper

Jim Farrand, James River Corp: overview of innovative security paper

Tom Gazda, Arthur D. Little: market survey on color reprographic equipment

John Haslop, Thomas DeLaRue Corp: counterfeit deterrence features used in world currency, and issues in designing secure banknotes

Bill Jumper and Bruce Radl, Ektron: input scanners and currency inspection methods

Mike Ott, IA Corporation: sensors for high speed Federal Reserve Board equipment

Bill Patton, General Electric Aerospace: engineering considerations of radar reflective paper

Roger Phillips, Flex Products: optically variable pigments

Jim Tsujita, Canon Corporation: counterfeit deterrent features built into copiers and printers

The committee acknowledges the following *government* and *Federal Reserve System* representatives (members of the New Currency Design Task Force are noted by an *):

James Brown* and Craig Einsel, U.S. Secret Service: counterfeiting experience in the U.S. and in foreign countries

Len Buckley, Bureau of Engraving and Printing: banknote designing and engraving

Jon Cameron*, Federal Reserve Board: how the Federal Reserve System operates

John Collins, Bureau of Engraving and Printing: counterfeit deterrent research

Tom Ferguson,* Bureau of Engraving and Printing: role of this study assisting the New Currency Design Task Force in evaluation of counterfeit deterrence methods

Mark Hepfinger, U.S. Army Natick R&D Center: dyes and pigments

Dan Littman, Federal Reserve System, Bank of Cleveland: survey of advanced counterfeit deterrence features

James Reese,* Federal Reserve Bank, Richmond: importance of secure currency

John Stoides,* Currency Technology Office, Federal Reserve System: advances in instrumental methods used by the Federal Reserve Banks to screen banknotes

Robert Stone,* Bureau of Engraving and Printing: issues related to counterfeit deterrent features

Color-shifting Inks

Color-shifting (optically variable) inks reflect various wavelengths in white light differently depending on the angle of incidence to the surface. An unaided eye will observe this effect as a color change as the viewing angle is changed. A color copier or scanner can copy a document only at one fixed angle relative to a document's surface. Therefore, a copier or scanner would record only one color of an image printed in an color-shifting ink, losing information about the reflectivity changes versus angle of incidence. Thus the color copied image will be obvious, since it will remain the same color regardless of the viewing angle. .

These inks are composed of color-shifting thin-film flakes suspended in a mixture of regular ink. The thin flakes produce their unique optical effect because of optical interference of light reflected from two parallel interfaces as shown in Figure 4-4. The reflected light from the two parallel interfaces will either constructively or destructively interfere with itself depending on the optical path differences.

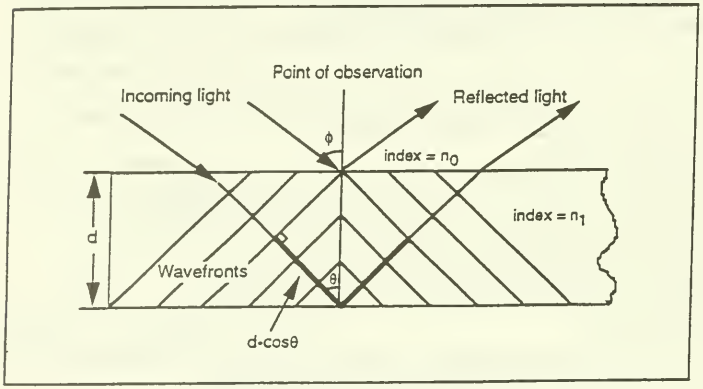

FIGURE 4-4 Color-shifting device principle of operation.

For a particular thickness of a thin film with two parallel interfaces, different wavelengths will constructively or destructively interfere at different angles. For example, the thin film may appear green at normal incidence and blue at 45° relative to the surface normal. The particular colors that are observed at normal incidence and at 45° relative to the surface normal will depend critically on the thin-film thickness. This thickness must be carefully controlled in the fabrication process and cannot be easily produced without expensive instrumentation.

The magnitude of the optical effect from the ink depends on the number density of thin-film flakes in the ink. The quality of the optical effect also depends on the precise orientation of the flakes on the surface of the ink. Physical forces cause the flakes to align parallel to the surface as shown in Figure 4-5. Without this preferential orientation, the optical effect would

be significantly degraded. The use of surfactants and functional groups on the thin-film flakes may further improve the optical effect. Figure 4-6 is a detailed cross-section of a typical thin film flake used as a pigment.

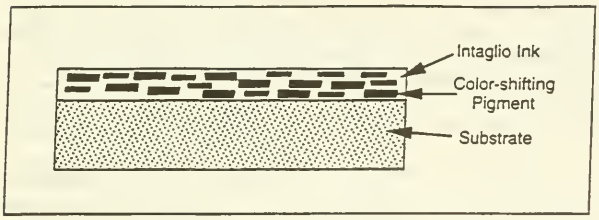

FIGURE 4-5 Color-shifting ink.

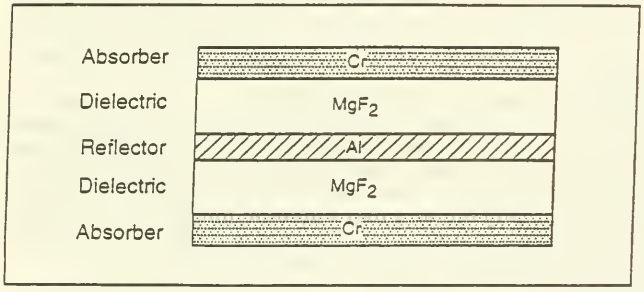

FIGURE 4-6 Cross-section of color-shifting pigment.

The intaglio inks with color-shifting thin-film flakes that are currently available produce a readily observed color change versus viewing angle under conditions of normal illumination.[5] The colors that are observed at normal incidence and 45° relative to the surface normal depend on the thin film thickness. In addition, dye or pigment filters can be added to the ink mixture to absorb particular light wavelengths. These absorbing dyes and pigments can further intensify and modify the observable color change of the ink versus viewing angle. With different combinations of flake thicknesses and dye or pigment filters, many color combinations are possible such as gold/green, green/magenta, green/blue, and green/black (Phillips, 1990, 1993). The committee's opinion is that the color changes, while noticeable (the committee thought that the last two pairs, of the four mentioned above, seemed to give the

[5]For example, OVI™ is a color-shifting intaglio ink available now from SICPA.

most noticeable color change, but this was a decidedly nonscientific sample), would be more effective if they were even more dramatic. The BEP should encourage the color-shifting ink manufacturers to continue to explore various combinations of dyes and optical flakes to intensify the optical interference effect.

A brief description of the fabrication process will illustrate the difficulty in reproducing color-shifting inks. Ultrathin films are initially deposited on a flexible planar substrate in high vacuum using electron-beam or sputtering-deposition techniques. The absorber/dielectric/reflector/dielectric/absorber structure is symmetrical, because the thin-film flakes can either be oriented up or down in the ink suspension. Typical materials used to obtain this multilayer structure are $Cr/MgF_2/Al/MgF_2/Cr$ or $Cr/SiO_2/Al/SiO_2/Cr$. Typical thicknesses for the layers are respectively 50 Å, 4,000 Å, 900 Å, 4,000 Å, 50 Å. The flexible planar substrate is dissolved and the thin film broken into flakes, 50 to 200 μm in diameter, which are then ultrasonically agitated to reduce the particle diameters to approximately 2 to 20 μm. Since the flakes are approximately 1 μm thick, they have a "pancake" structure with an aspect ratio that averages 10 to 1. Because typical printed ink thicknesses are between 5 to 30 μm this high aspect ratio helps align the flakes parallel to the surface of the ink.

The high-technology manufacturing process enhances the security of this ink, since the process is far beyond the capabilities of most (but not all) counterfeiters. Simulation is possible using inks that have metallic sheen. However, these inks do not change color. If the public is aware of the color change and knows how to observe it, and if the ink is used to print a design that is somewhat complex, simulation will be very difficult.

Macroscopic thin-film devices, such as interference films, can also produce excellent color-shifting effects. However, these large films are very susceptible to mechanical damage and they typically fail the "crumple" test. The small size of the thin-film flakes in the color-shifting ink precludes significant mechanical damage. They are already broken up and dispersed in the ink, and crumpling does not adversely affect their optical performance. The optical flakes are fairly chemically resistant, because they are composed of relatively stable metallic and dielectric materials. Moreover, they are embedded in the ink mixture, which protects them to some extent from chemical exposure.

The ink is compatible with intaglio and silk screen printing; it cannot, at this time, be applied using a lithographic or offset process. The cost of the ink is extremely high compared with the usual intaglio inks (two orders of magnitude more expensive), but it is not so expensive as to be impractical. However, since this is a new technology, the committee feels that with additional development effort, a significant reduction in the current cost of this ink may be possible.

Test banknotes printed with color-shifting ink have been subjected to the usual gamut of tests. The notes did not perform exceedingly well in the 24- acid soak or alkali soak tests, as was be expected (BEP, 1993). On the other hand, notes printed by other countries using color-shifting inks have not yet shown ink-related durability problems. A potentially fruitful area of research would be investigating ways to enhance the effect of the color shift. The concentration of the ink pigment, the size of the coated area, printing method, and the presence of a reference color can be optimized to enhance the effect. It was also demonstrated to the committee that having a reference color that does not shift color immediately adjacent to the image printed with color-shifting ink makes the color shift more dramatic. And, since

the color-shift effect does require manipulation by the observer relative to a light source, care must be taken in the design of the printed image to provide a large enough area that the effect can be readily discerned.

Many countries are beginning to apply these inks to print small images on their banknotes. Examples are the German 500 and 1,000 Deutschemark, the 50,000 Italian Lira, and the 10,000 Belgian Franc. Other countries are considering adopting color-shifting ink and may do so in the near future. Their experience should be closely monitored.

Color-shifting ink could be implemented fairly quickly by the BEP if the need arose, and hence is recommended by the committee as a feature for consideration in the short term. Additional research directed at enhancing the color shift should be encouraged.

Metameric, Photochromic, and Photoluminescent Inks

Whereas the effect of color-shifting inks can be seen in sunlight or incandescent light, other specialty inks display effects that require additional perturbations to obtain their unique signatures. Consequently, additional light sources or special viewing instruments are required to see their effects. Despite this disadvantage, these specialty inks can potentially be an effective measure against counterfeiting by color copiers or scanners. Most of these specialty inks are visible or ultraviolet inks.

Metameric ink pairs are designed to appear the same color under a particular illumination. When illuminated with a different light source, the metameric ink pair yields a different color. Metameric inks could have great utility if they induced a color change in the process of replication that subsequently produced a copy that did not accurately duplicate the original color. However, the previous evaluations of metameric inks have judged their color changes to be too subtle to be an effective deterrent. Since the last committee report, there is no new evidence to suggest that this situation has changed. Metameric inks must be judged an intriguing prospect for the future, and research developments should be monitored.

Photochromic inks have color properties that change as a function of light illumination. Well known examples of photochromic materials are the silver halides or spiro compounds found in sunglasses, which darken when exposed to bright light. The principle of photochromic inks is based on the photochemical conversion of the original compound to a photoproduct with different optical properties. For example, exposure to ultraviolet light can lead to molecular bond breakage and ring opening in various aromatic molecules, such as adamantane-2-spiro-naphtopyran. Upon ring opening, the light absorption properties will change, resulting in a change of ink color. After photochemical excitation, the photochromic inks revert back to the original state.

One drawback is that this excitation process is generally time consuming, reported to require seconds to minutes. However, faster response times have been recently reported for some experimental inks (Hepfinger, 1993). Fast reaction times and dramatic color change must be demonstrated before these photochromic materials can be seriously considered.

Another issue with photochromic inks is their long-term chemical stability. They are known to experience photochemical fatigue and will degrade with time. Even the best photochromic inks will degrade after several thousand photochemical conversion cycles, although the degradation rate may be a function of light intensity. The importance of this

SICPA HOLDING S.A.

Direction Générale

Correspondance:
2, rue de la Paix
Case postale 3930
1002 Lausanne
SUISSE
Tél. 41/21/311-4910
Fax 41/21/312 6895

TELEFAX

TO. Mr Jerris Leonard
Leonard, Ralston, Stanton & Danks, Washington

FROM: H. Bretler

DATE: June 16, 1994

NBR. OF PAGES: three (3) inclusive

RE: **CURRENCY PAPER WITH PLANCHETTES**

I have been unable to obtain much of an update on my information and since I will not be at work starting Monday, June 20 until Monday, July 4, 1994, I want to answer your query to the best of my knowledge:

By planchettes the specialist makers design a currency paper into which confetti-like pieces of various matters are embedded, similarly to the threads visible on the present day U.S. currency stock. The planchettes can be coloured or fluorescent or both and, more recently, iridescent planchettes have made their way into currency paper. Under iridescent we understand a material or a coating which is shiny and that shows some colour changes upon shifting. The quality of iridescence varies from opalescent (pearl-like) to something similar to what we have in OVI™, except that the shift is not precise from one defined colour to another well-defined colour, rather the transition is through a rainbow-like range of colours.

To enlarge on the above, we can say that the weakness of the system consists in the fact that they can be very easily simulated by sticking on the paper small confetti-like pieces of iridescent materials such as Christmas wrapping materials which of course are readily available. The advantage of iridescent planchettes is that they are relatively inexpensive and can probably be introduced into the paper by the same general method the paper manufacturers introduce other features.

Also, the iridescence will not be reproduced by colour copiers. This is where similarity with OVI™ starts and ends.

The enormous advantage of OVI™ as compared to even the best quality planchettes is that OVI™'s colour shift is precisely defined and can be made to be unique; it is not only printing ink allowing reproduction of fine and intricate designs but is an intaglio printing ink so that such designs can be printed by the very method by which currency is printed

SICPA®

Regarding the cost of OVI™: While the absolute cost per pound is high, the relative cost seen as the quantity of ink used per note and as protection it affords, is not high at all - and I think that we have supplied ample information on this.

Jerris, there are many ways to protect a banknote or a house or any piece of property. Depending on the value of the property, one wishes to protect, and depending on the threat, one can choose a series of low cost barriers or one higher cost, high quality barrier. OVI™ is the best barrier known today against counterfeiting and many countries, among which are some of the technologically most advanced ones, have recognised that the price of OVI™ is fully acceptable. Some other countries have chosen planchettes which are a lower cost, lower level protection and then had to supplement them by other means of protection. One can wonder whether the final cost is not the same for a hodgepodge of feature.

Best regards,

for H. Bretler

PS: Jerris, as I just told you over the phone, enclosed please also find a short description made by Mr Alain Marchand, Associate Director of our Security Inks Division, so that you get the story twice.

SICPA®

PLANCHETTES

Iridescent planchettes are manufactured from iridescent sheets which are punched out and sprinkled to the wire at the wet-end of the paper machine so that they appear on the surface of the paper, albeit slightly embedded so that they adhere to the substrate.

The objective of planchettes is to provide a reasonably economical means of protecting currency against counterfeiting; this has traditionally been used, because of its low cost, by third-world countries so that they can be readily identified by the public.

However, the system has a number of inherent disadvantages:

- Because the planchettes fall on the substrate, in a hathazard manner, half of them will be embedded upside down and produce no iridescent effect. This is in effect a 50 % waste.

- During the printing process, planchettes have a tendency of breaking free and ending up on the blanket, requiring not only frequent wash-ups, but also provoking misprints and other technical problems.

- Planchettes are quite easy to imitate:
  A counterfeiter can easily punch a shiny plastic material and glue these to the surface of the notes.

In conclusion, with the appearance of a number of more effective optically variable devices such as OVI™, the use of planchettes has diminished somewhat.

Lausanne, June 16, 1994
AM/hw

CUMMINS
CUMMINS-ALLISON CORP.

Executive Offices

891 Feehanville Drive
Mt. Prospect, IL 60056
Facsimile: 708/299-4940
Telephone: 708/299-9550

July 11, 1994

RECEIVED
JUL 13 1994
Committee on Banking, Finance
& Urban Affairs

The Honorable Henry B. Gonzales
United States Representative
Chairman, House Committee on Banking,
Finance and Urban Affairs
2129 Rayburn HOB
Washington, D.C. 20515-6050

Dear Chairman Gonzales:

Cummins-Allison Corporation respectfully submits the enclosed Testimony for your Committee's consideration during the July 13 Hearing on the Redesign of the U.S. Currency. Cummins is a world leader in the manufacture of high-speed, low cost currency scanners. The enclosed Testimony discusses the affect on industry of plans to redesign U.S. Currency for improved counterfeit deterrence.

We would appreciate your Committee including this Testimony in the July 13 Hearing Record. Thank you for your attention to this request and to our interests in the currency redesign issue.

Sincerely,

William J. Jones

William J. Jones

enc.

TESTIMONY OF

WILLIAM J. JONES

EXECUTIVE VICE PRESIDENT

CUMMINS-ALLISON CORP.

TO THE

HOUSE COMMITTEE ON BANKING & URBAN AFFAIRS

JULY 13, 1994

Thank you for allowing Cummins-Allison to provide testimony to this Committee related to the potential effect on the currency scanning industry of the various counterfeit deterrent strategies being considered for U.S. currency by the U.S. Department of the Treasury.

Cummins-Allison Corporation is a U.S.-based office machine manufacturer founded in 1887. Today, Cummins is a world leader in the manufacture and sale of machinery and office equipment used by banks, vendors, and retailers to count, sort, verify, and package coin and currency. Cummins maintains manufacturing facilities in the Chicago area (2) and Indianapolis, Indiana (1) as well as 45 sales and service offices throughout the United States and sales agent offices in over 20 other countries. This worldwide sales and service network supports our customer groups which include U.S. based commercials banks, savings and loans institutions, retailers, credit unions, vendors, and other businesses that must process significant quantities of currency and coin within their business operations.

Until approximately three years ago, currency scanners available in the marketplace to count, sort and authenticate U.S. currency were expensive (between $25,000 and $250,000 per machine), large (ranging from the size of a small refrigerator to the size of two cars) and relatively slow (600 documents per minute). This large, costly, and slow scanning machine technology did not lend itself to use by retailers or bank networks for the scanning and authentication of currency.

After significant research, development and capitol expenditure, in 1991 Cummins responded to industry demand for a low cost, compact and fast machine to scan and authenticate currency. These smaller machines (about the size of a toaster oven) are now installed in bank branches throughout the United States. This new technology retails for approximately $3,500 per unit (a fraction of the cost of the previous technology and is extremely efficient).

The low cost and compact size of these new generation scanners has enabled U.S. commercial banks to install the currency scanners in branch locations at teller stations for verification of cash deposits by commercial accounts such as retailers, restaurants, gas stations, etc. This new technology has enabled banks to enhance their ability to identify counterfeit notes at the point of entry into the banking system. This has led to enhanced counterfeit deterrence for banks, and the early identification of people attempting to pass counterfeit notes into the banking system. Prior to the introduction of these scanners at bank branches, counterfeits could not be easily identified until currency notes were passed to the central bank's vault headquarters where the large currency scanners were located. By the time the notes reached the central vaults, several days or weeks had passed and it was often too difficult to trace the counterfeit back to the branch receiving the counterfeit note, let alone the original depositor. Today, thousands of bank headquarters and branch locations, as well

as retail locations throughout the United States, have installed Cummins' currency scanners.

The banking, vending and currency scanning industry will be dramatically affected by the U.S. Department of Treasury's decisions related to the adaptation of U.S. currency for improved counterfeit detection. There are several very important issues that deserve the careful consideration of Congress and the U.S. Department of Treasury during this developmental period.

I. Disruption To U.S. Banking and Vending Systems

Proposed adaptation of U.S. currency for improved counterfeit protection may result in the need to modify existing currency processing equipment for the processing of new currency. Because the possible changes have not been disclosed (for security reasons) by the U.S. Department of Treasury it is difficult for Cummins and other manufacturers to reassure the thousands of banking customers of the ease (or difficulty) of adapting existing equipment for the processing of a potentially new U.S. note. When the U.S. Department of Treasury changes the characteristic of U.S. currency, it is Cummins' desire that consideration be given to the need to promptly adapt currency scanning machines to assure minimal disruption to the banking and vending industries.

Cummins has reviewed the recently issued National Research Council (NRC) report titled, "Counterfeit Deterrent Features for the Next Generation Currency Design". It is Cummins' understanding that this report represents the most authoritative, comprehensive and reliable public information available, and that it was generated to assess various technologies as they relate to counterfeit deterrence and to summarize potential changes to U.S. currency design. Cummins is supportive of the currency counterfeit deterrent adaptations referenced in the NRC report. Addition of such adaptations will enhance the ability of scanners to authenticate (real) U.S. currency and easily identify suspect or counterfeit currency at high processing speeds.

It is interesting to note that one of the conclusions made in the NRC report is; "the casual counterfeiter would be significantly deterred if relatively simple, speedy, and inexpensive point of sale devices were commercially available and commonly used to authenticate bank notes. Such devices would detect one or more deterrent features incorporated in the note." These "devices" exist today in the form of Cummins scanners, currently in use, as stated earlier, in thousands of locations throughout the U.S. and the world.

A majority of the design changes regarding currency authentication and counterfeit deterrence discussed in the National Research Council report could be incorporated without requiring substantial modification of the existing Cummins currency scanners. There are certain changes discussed within the NRC report, however, that could make virtually obsolete the existing installed base of machines. Specifically, the possible changes that would prove very costly for Cummins' banking and vending industry customers are:

A. Changes in the dimensions of U.S. currency:

Most currency handling machines used by banks today are designed to feed, transport, and stack the U.S. currency based upon current currency dimensions. Changes to the physical size of the currency would require redesign and re-tooling of not only currency scanner equipment, but many other currency handling devices. Additionally, the change in the current bill size could make it impossible to re-tool and retrofit existing machines located throughout the United States. Change in currency dimension would require physical changes to the dimension and drive systems of currency transport systems within currency handling machines that would be too costly for a retrofit of existing Cummins' machines used by banks throughout the U.S.. Cummins believes that the current currency size and dimensions should be retained to reduce negative impact on the banking, vending and scanning industry.

B. Changes in the symmetry of the images on the front (black) and back (green) side of the note. Making the images on the front/back of U.S. notes larger or smaller than the current notes would not present a significant problem:

Cummins-Allison has developed the low cost currency scanning technology to scan U.S. currency based upon scanning a .900 wide strip down the center of the green side of the currency in the latitudinal (narrow) direction. This technology is highly accurate because the green side printing on current U.S. currency is distinctly different from bill to bill and mostly symmetrical in the center of the note. Bill graphics that are not distinctly different or mostly symmetrical in design would obsolete current scanner technology, thus forcing Cummins and other affected industries to develop a new or modified technology that could handle asymmetrical patterns.

For example, the current $1 bill is easily scanned using current technology because the center of the printed image consists of horizontal graphics that are mostly symmetrical. Conversely, the current $10 bill is more difficult to scan

because the center of the printed image (U.S. Treasury Building) consists of angular graphics that make the bill slightly asymmetrical. Development of more advanced asymmetrical technology might take several years to perfect, which would have an adverse effect upon the banking and scanning industries.

It would be costly and time consuming to retrofit the thousands of scanners currently used by banks, to enable the existing machines to scan current issue U.S. currency as well as the new currency. If the U.S. Department of Treasury retains symmetry, Cummins and other affected industries will likely be able to develop a retrofit/modification kit within one to six months. Once such a kit is available, an additional six to twelve months would be required to complete installation in all existing machines throughout the U.S..

However, if the U.S. Department of Treasury adopts an asymmetrical pattern for the new currency, it may take six months to several years for development of a retrofit kit. Additionally, retro-fitting existing machines to scan asymmetrical patterns on currency will likely prove too costly (cost of boards, software, relocation of sensors, and other hardware) for practical application of a retrofit.

C. Elimination of the fine line border:

Currently, all U.S. currency has a fine line border on both the portrait and green side of the note. This fine line serves as an excellent registration mark to identify the beginning of a printed image. This definite demarcation is important due to the inconsistencies that exist in how the printed image is located on the cut sheet of U.S. notes. The fine line border should, if at all possible, be retained on U.S. currency notes.

II. Close Collaboration With Related Industries

Cummins currently provides coin sorting and currency handling equipment to many countries including Canada, the United Kingdom, Germany, Spain, Switzerland, Mexico and Australia. Cummins is in the process of developing products for Asian markets.

The United States is not the first country to introduce new currency or new coin during the last decade. Cummins has worked closely with central banks and Mints in other parts of the world in coordinating releases of new coin or currency. We hope to have the

same opportunity for close coordination and cooperation with the U.S. Treasury Department and the Bureau of Engraving and Printing (BEP).

An important step in the process of releasing new coin or currency is advance notice to the manufacturers of equipment that is used by banks to process, sort, and package coin and currency. For example, the Royal Mint of England notified industry of release of the new "one pound" coin approximately two years prior to release for circulation. The coin was fully defined in dimensions and characteristics. Approximately one year before the release, industry was provided samples of this coin to allow them to experiment with the adaptation of current United Kingdom coin sorters to process this new coin. Once this testing was completed, industry had approximately nine months to adapt and retrofit the hundreds of coin sorting machines being used by Cummins' customers throughout the United Kingdom.

With the United Kingdom transfer, the Royal Mint communicated early with key industry representatives. Cummins was able to adapt all of our customer's machines as least 60 days prior to release of the new coin. As a result, once the new coin was released, there was little interruption to the United Kingdom vending and banking systems which are heavily dependent upon the automated processing of coin and currency. We look forward to working with the U.S. Department of Treasury to minimize impact on industry of adaptation of U.S. currency. Cummins has been pleased with the responsiveness of the U.S. Department of Treasury to our interest in having advance notice of currency adaptation.

III. Preservation of U.S. International Competitiveness

Cummins is the first manufacturer in the world to develop a low cost scanning technology. As a result, the United States enjoys a worldwide lead in the development and release of this technology. Development of this technology has resulted in a significant increase in overseas demand for Cummins' currency scanners. Overseas markets represent the greatest potential within the scanning and sorting industry for growth in domestic employment.

If the U.S. Government adapts a radical change in U.S. currency that does not consider industry needs, the reallocation of personnel necessary to adjust to the new currency design will have an adverse effect on the international competitiveness of the U.S. scanning industry. The reallocation of technical staff, necessary to adjust to domestic requirements, may last for several years. As a result, the U.S. scanning industry may be forced to abandon or

delay international marketing opportunities. This potential problem underscores the advantages of U.S. industry having a close interaction with the U.S. Department of Treasury and the B.E.P. to enhance and support U.S. technology for use in the United States as well as other parts of the world.

In conclusion, Cummins appreciates the opportunity to share its views with the Committee related to adaptation of U.S. currency for counterfeit deterrence. We look forward to working closely with appropriate Executive Branch agencies to assist in assuring a smooth transition, with minimal negative impact on domestic scanning industry employers, during introduction of newly designed currency.

CUMMINS
CUMMINS-ALLISON CORP.

Executive Offices

891 Feehanville Drive
Mt. Prospect, IL 60056
Facsimile: 708/299-4940
Telephone: 708/299-9550

July 11, 1994

Treasurer Withrow
1500 Pennsylvania Avenue, N.W.
Room 2134
Washington, D.C. 20228

Subject: Potential design changes to United States Currency

Dear Treasurer Withrow:

Thank you for taking the time to visit with Doug Mennie and me during our recent visit to Washington, D.C. on Tuesday, June 14, 1994.

As we discussed, Cummins' is concerned about potential design changes to the U.S. currency. Cummins manufacturers a compact, low cost, high speed currency scanner which is utilized by United States banks in thousands of banking offices and branches throughout the United States.

Recent reports by the press have generated concern on the part of our U.S. bank customers relative to the ability of Cummins scanners (and currency processing equipment of other manufacturers) to deal with the reported design changes to the currency. Our banking customers are concerned a change in the design of U.S. currency may not be compatible with the current design of currency which could make the automated processing of U.S. currency extremely difficult. Cummins-Allison and our many bank customers hope that changes to the U.S. currency will be implemented in a manner so that Cummins currency scanners will be able to process both the newly issued U.S. currency as well as the current notes. Clearly, the public's interest will not be served if changes are made to the currency that would obsolete the thousands of Cummins scanners installed throughout the United States, as well as currency processing equipment manufactured and provided by other suppliers of currency handling equipment.

We understand the difficulties associated with publicly announcing changes in U.S. currency design. The most comprehensive and authoritative government document currently available in the public domain is the document entitled, "Counterfeit Deterrent Features For The Next Generation Currency Design," authored by the National Research Council. Specifically, this report was authored by the Committee on Next Generation Currency Design.[1] Cummins comments will revolve around the information provided within this report.

The National Research Council report expresses concern relating to the enhanced ability of the casual counterfeiter through utilization of new technology. The casual counterfeiter's use of

a color copier and sophisticated software to produce counterfeit currency is seen as the greatest threat to the integrity of U.S. and other currencies. The recommended solution will be the inclusion of additional counterfeit deterrent features such as water marks, security thread modifications, infrared inks, photo luminescent inks, color shifting inks, or other counterfeit deterrent features. Cummins supports the addition of such counterfeit deterrent attributes.

Cummins currency scanning system is based upon scanning to denominate and authenticate (counterfeit detection) currency as it is processed through our equipment. Currently, the machine scans to verify the proper image for a given denomination note and then authenticates the note's validity via use of sensors to detect the presence of magnetic ink. However, if additional counterfeit deterrent attributes, such as water marks, threads, infrared ink, etc. are added to U.S. notes, Cummins would incorporate additional authentication sensors to verify the presence of the additional counterfeit deterrent attributes as well.

Cummins faces a unique challenge with the potential change to U.S. currency because of the large volume of Cummins scanners currently in use. In fact, the Cummins scanner is indirectly described in the National Research Council report on page six:

> "The committee's opinion in that the casual counterfeit would be significantly deterred if relatively simple, speedy, and inexpensive point of sale devices were commercially available and commonly used to authenticate bank notes. Such devices would detect one or more deterrent features incorporated in the note." [2]

As we explained during our meeting, Cummins scanning technology addresses the point of sale denominating/authenticating equipment outlined within the report. Because of our large installed base, and our desire to insure continued use of these machines even after the new currency is issued, we request early participation in the process of deliberation by government agencies relative to new currency designs.

I. KEY ISSUES RELATIVE TO CURRENCY DESIGN CHANGES AND CUMMINS SCANNING TECHNOLOGY

1. Cummins scanning technology can be adapted to handle the incorporation of as many counterfeit deterrent features or attributes as the U.S. Department of Treasury wishes to incorporate. The Cummins' scanner has been designed to incorporate additional sensors for the verification of the correct image and value by denomination. In fact, the addition of other counterfeit deterrent features will simply enhance the performance of Cummins technology.

2. Cummins requests involvement in the process of a new currency design release at least two years in advance of final issue to the public. This lead time is required by Cummins to design modification to our technology, test modifications, and release retrofit kits for installation in our thousands of currency scanners in use at banks throughout the Unites States.

3. We recommend that the United States Government not release a new design for all denominations at one tine. Instead, we encourage the release of a new design for one denomination per year, which will enable industry to economically and effectively ingest the new currency.

4. In general, most of the potential changes under consideration, as outlined in the National Research Council report, can be adapted to our technology so that Cummins would be able to retrofit existing machines. There are, however, three attributes of the existing design of currency which Cummins prefers not to changed. These specific design changes are outlined in the enclosed testimony.

We enjoyed meeting with you recently, and hope the Treasury Department will include Cummins in the process of deliberation relative to Next Generation Design of Currency at the earliest possible date. We look forward to hearing from the Treasury department relative to our request for participation.

Sincerely,
CUMMINS-ALLISON CORP.

William J. Jones
Executive Vice President

1. Counterfeit Deterrent Features for the Next Generation Currency Design - by: Committee on Next Generation Currency Design: National Material Advisory Board, Commission on Engineering and Technical System: 2101 Constitution Avenue, NW, Room MA-262, Washington, DC 20418
National Research Council
Publication NMAB-472
National Academy Press, 1993
Library of Congress Catalog Number 93-87390

2. IBID Chapter One, Page 6.

★★ United States Currency Accessibility Coalition ★★

J.F. Oschwald/Cherie Hendricks
5990 Richmond Hwy. Suite 1209
Alexandria, VA 22303 (703) 960-1559

The blind and visually impaired for far too long have been omitted from independent use of United States currency. The problem of identifying between different denominations of currency is one that is real and urgent. By solving the currency identification problem, the United States will come up to par with a score of other countries around the world that have included their blind populations in currency usage.

Today, a great opportunity is at hand for a solution to be implemented. As the Treasury Department advocates currency changes for security reasons, it is also a prime time to address and resolve the problem of currency identification. A high interest in doing so is being shown within the blind community, on Capitol Hill, and by the Department of the Treasury. Let us make sure that the efforts, work and studies generated from this interest do not go in vain.

With the spirit of the ADA in its infancy, making the currency accessible to all citizens is a sure way to show the nation that a genuine concern for all its people is taking hold in Washington. Financial independence for the blind is a small benefit in comparison to the message it would send to the population and the world. It is time that a sincere effort to include all citizens in the American way of life is seriously undertaken.

Please join and support this effort. We hope that, together, currency identification will no longer be a problem, and that a new dimension of financial freedom will at long last be granted to the blind and visually impaired.

Thank you for your time and interest,

J.F. Oschwald Cherie Hendricks

★★ United States Currency Accessibility Act of 1994 ★★

J.F. Oschwald/Cherie Hendricks
5990 Richmond Hwy. Suite 1209
Alexandria, VA 22303 (703) 960-1559

June 24, 1994

Tristan North
Rm. 2129
Rayburn Office Building
Washington D.C. 20515

Dear Tristan:

It was a pleasure and a great help talking to you Thursday. We have been working with Ms. Seyfried in Rep. Kennedy's office for quite a while and welcome any new people we can work with that will expedite our effort. Enclosed is a summary of our work and goals that we hope you will find useful.

The concept of currency accessible to the visually impaired is not new. In fact, the United States today is behind a score of countries throughout the world that accommodate their blind populations through tactual identification of denominations. Our efforts have been to bring the United States up to a position where its blind population is second to none in the world with regards to currency usage.

With modifications to the currency to combat counterfeiting problems in the works, the time will never be more appropriate, from cost and perceptual points of view, to implement such changes to the currency. If the counterfeiting changes go through without consideration for the blind, a true opportunity will be lost. It would not speak well of the government, especially in light of the ADA and all the good will that spirit has generated. Now is the time to give the blind population a new sense of financial freedom, and we are very encouraged that this goal will be met.

We will work closely to coordinate any efforts you see to speed legislation along so that the opportunity to resolve this problem for the blind won't be missed. We will be in contact with you soon with a list of questions to be asked by the committee on July 13. Thank you for your help and for your interest.

With Kindest Regards,

J.F. Oschwald

Cherie Hendricks

Bay State Council of the Blind
Resolution 94-02

Whereas, the ability to independently identify currency is a basic assumption of a free market system, where buyers and sellers know the means of exchange in the choices they make; and

Whereas, the United States, a premiere capitalist nation, has long been issuing paper currency in which denominations are visually distinguished by symbols, patterns, and pictures; and

Whereas, colors, textures, and sizes could distinguish currency for citizens who are blind or visually impaired; and

Whereas, the American Council of the Blind has repeatedly declared by resolution its support for research and implementation of accessible currency in America; and

Whereas, several European countries have implemented accessible currency for years, thereby demonstrating its feasibility; and

Whereas, the U.S. Department of Treasury is currently researching the redesign of currency in order to reduce the chance of counterfeiting; and

Whereas, sighted as well as blind and visually impaired people would benefit from a better, universal design that is easy for everyone to distinguish; and

Whereas, a shocking seventy percent of working-age blind people are unemployed, and accessible currency would reduce a significant hurdle in the paths of many seeking self-employment: now, therefore:

Be it resolved, that the Bay State Council of the Blind in convention assembled this twenty-first day of May 1994 in Newton, Massachusetts, that this organization affirms the need for accessible currency that may be independently identified by any American; and

Be it further resolved, that we urge Congress and the Department of Treasury to make this a reality in the foreseeable future.

★★ United States Currency Accessibility Act of 1994 ★★

USCAA of '94
J.F. Oschwald/Cherie Hendricks
5990 Richmond Hwy. 1209
Alexandria, VA 22303
(703) 960-1559

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-- The American Council of the Blind's formal endorsement of the USCAA of '94 idea and goals

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★★ United States Currency Accessibility Act of 1994 ★★

J.F. Oschwald/Cherie Hendricks
5990 Richmond Hwy. 1209
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There is a push, in this session of Congress, to make the United States currency tactually identifiable by the blind and visually impaired. The draft legislation and title given to this effort by the American Council of the Blind is the United States Currency Accessibility Act of 1994 (USCAA of '94). The overall goal of this initiative is for Congress to direct the Treasury Department, through legislation, to make U.S. currency tactually identifiable to the visually impaired within a certain time frame.

A simple, tactual method for achieving this goal has been developed and tested. For research and testing purposes, a small hole is used as the tactual mark. Each denomination of currency has one hole in a certain location. The system works as long as the identifying mark is located in one sectional quarter of the bill. Any pattern of six tactual marks within one quadrant of the bill will work. In order for the visually impaired community to become familiar with the locations of the marks, a credit card sized template with corresponding marks in braille can be used. However, this method is only a proposed one.

The proposed method was tested at the American Council of the Blind's 1992 National Convention. Out of 310 persons tested, 307 endorsed it as an easy to use, simple and logical solution. The Lions World for the Blind, a prominent international blind rehabilitation center in Little Rock, AR, formally tested the idea in February of 1994. Once again, the results were overwhelming. Out of 61 blind and visually impaired individuals, 57 were functionally literate and able to use the system within fifteen minutes of use. This proposed method and the overall initiative have been formally endorsed by the American Council of the Blind, the Blinded Veterans Association, the Louisiana Council of the Blind, the Louisiana State Legislature and Lions World Services for the Blind.

In 1983, a similar effort was made to solve the currency problem. However, the possible methods that were explored were deemed expensive and ineffective. The failed proposed solutions explored at that time are still referred to today when any current effort to draw attention to the problem is made. Over ten years later, in this session of Congress, the Treasury Department will introduce modifications to the currency. The National Academy of Science, commissioned by the Bureau of Engraving and Printing, is currently doing a formal study investigating methods of making currency identifiable by the visually impaired. The USCAA of '94 was consulted and participated in this study and will be part of its recommendations. It is only appropriate that with the spirit of the ADA about, any modifications to U.S. currency should consider the visually impaired community. Our idea was conceived, brought into existence, and tested to aid the government in fulfilling this ongoing need.

Being in its infancy, the USCAA of '94 has barriers and odds against it. However, efforts such as these are possible when people unite to see that they are fulfilled. A grassroots movement with people calling and writing representatives from their home districts is needed. The help that the USCAA of '94 will get by support in the home districts will be immeasurable here in the Beltway. Along with other critical blind issues to be lobbied for, let this one be the newest. We hope that, together, identification of currency will no longer be a problem and a new sense of financial freedom will at long last be granted to the blind and visually impaired.

Please call or write at the address above for information, supplies, documentation, and ways that you can help.

DRAFT LEGISLATION

CURRENCY ACCESSIBILITY

SECTION 1. SHORT TITLE

This act may be cited as the "United States Currency Accessibility Act of 1994".

SECTION 2. FINDINGS AND POLICY.

(a) The Congress finds that--

(1) The Federal Reserve Notes of the United States are inaccessible to individuals with visual disabilities,

(2) The Americans with Disabilities Act enhances the economic independence and equal opportunity for full participation in society for individuals with disabilities; and

(b) Policy--

The currency of the United States shall be designed and produced so that it is tactually identifiable, thereby enabling individuals with visual and other disabilities which limit their ability to read print to independently use all denominations of currency;

SECTION 3. FEDERAL RESERVE NOTES REQUIRED TO BE ACCESSIBLE.

(a) Requirement-- The Secretary shall develop a design for Federal Reserve notes and a method for producing such notes, so that such notes are tactually identifiable.

(b) Implementation-- All Federal Reserve notes which are issued after the end of the 1-year period beginning on the date of the enactment of this Act shall be tactually identifiable as required by paragraph (a) of this section.

(c) Definitions-- "Secretary" means the Secretary of the Department of the Treasury.

LIONS WORLD SERVICES FOR THE BLIND

Jim Cordell, Director
2811 Fair Park/P.O. Box 4055
Little Rock, Arkansas 72214

Study of
A Method of Tactual Identification of U.S. Currency
Test Results

Test Site: Lions World Services for the Blind,
Little Rock, Arkansas

Test Dates: February 7,8 & 9, 1994

Number of Participants (Total-- 61)

HISTORY OF LIONS WORLD SERVICES FOR THE BLIND:

Lions World Services for the Blind, located in Little Rock, Arkansas, is a rehabilitation center for individuals who are blind or visually impaired. The center was founded in 1947 and is accredited by the National Accreditation Council for Agencies Serving the Blind and Visually Impaired. LWSB's programming is comprehensive in nature, providing training skills needed to compensate for loss of vision, vocational skills training, and other specialized programs. During 1993, 391 individuals participated in LWSB programs.

On February 8 and 9, 1994, Lions World Services for the Blind assisted J.F. Oschwald in a survey of an alternative tactual method for identifying United States currency. The Technology Outreach Program, which is housed at Lions World Services for the Blind, acted as testers for this survey.

ORIENTATION OF THE TESTERS:

On Monday, February 7, 1994, J.F. Oschwald met with three individuals designated to act as testers. They were: Mike Cordell, Jan Lynch and Cindy Plummer. In the orientation session, Mr. Oschwald explained basic testing procedures and demonstrated the proposed method. The importance of accurate recording of testing results was stressed. A format for reporting survey results was also agreed upon during the session.

PROCEDURE FOR TESTING:

-- Braille Users:

Each survey participant was given a short period of time to become familiar with the markings of each denomination of currency and the associated braille template. Once the participant indicated comfort with the currency and template, as appropriate, the tester explained and demonstrated the following procedure:

1. Locate the star-shaped hole in the bill.
2. Turn the bill until the hole is in the lower left quadrant.
3. Turn the braille template until the clipped corner is in the lower left corner.
4. Position the braille template under the bill so the left and lower edges of the template and bill are flush.
5. Locate braille dot through the hole.
6. Raise the bill slightly and read the denomination of the currency indicated by the location of the braille dot.
7. Indicate the denomination of the bill.

-- Non-Braille Users:

Individuals who had residual vision were asked to participate in the survey without using vision. There were no objections. Therefore, low vision participants and non-braille users were shown several different currency with star-shaped holes. The locations of the holes for different denominations were discussed and demonstrated. After the participant examined several different denominations, the tester explained the following procedure:

1. Locate star-shaped hole in the bill.
2. Turn the bill until the hole is in the lower left quadrant of the bill.
3. Examine the position of the hole.
4. Indicate the denomination of the bill.

-- Currency Identification:

Survey participants selected currency from a large bowl. The condition of the currency used ranged from crisp to extremely worn out bills. Participants were asked to select one bill and state the denomination of each bill. This procedure was repeated 10 times. At that point, if the participant had been relying on the braille template, he/she was encouraged to attempt identification of the currency without the template. The tester recorded the condition of the bill and the accuracy of the participant's identification. See Appendix A for results.

SURVEY FINDINGS AND RECOMMENDATIONS:

Fifty-Six (56) participants stated that they liked this method for identifying currency. Most stated that they felt their confidence would increase with more practice. There were, however, some recommendations for changing the identification method. They recommendations were:

1. Decrease the space between the holes.
2. Enlarge the size of the holes.
3. Make holes more easily identifiable.
4. Place rubber backing on braille template to prevent the bill from moving easily.
5. Position the holes closer to the bottom of the bill.

Five (5) participants stated they did not like this currency identification method. Their comments were:

1. This method of identification is too slow.
2. Braille should be placed on the bill instead of using this method.

One of the five indicated that he thought he might be able to use this method with a great deal of practice.

APPENDIX A

LIONS WORLD SERVICES FOR THE BLIND
ALTERNATIVE TACTUAL METHOD FOR IDENTIFYING U.S. CURRENCY
BY BLIND AND VISUALLY IMPAIRED INDIVIDUALS
SURVEY RESULTS

I. Survey Participants:
- 61 Total number of individuals tested
- a. 38 Total number of braille users
- b. 23 Total number of non-braille users

II. Age of Individuals Tested:
- a. 5 10 - 20 years of age
- b. 35 21 - 40 years of age
- c. 18 41 - 60 years of age
- d. 3 Over 60 years of age

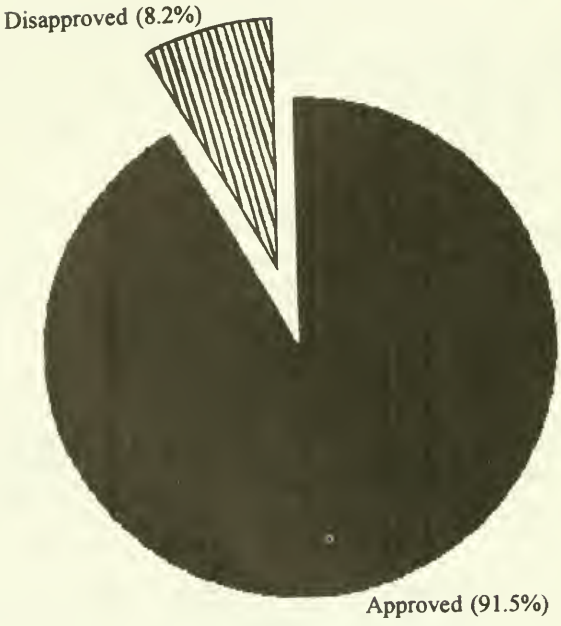
III. Accuracy Rate Over a 15 Minute Period:
- a. 30 100% correct
- b. 13 93.4% correct
- c. 4 86.7% correct
- d. 5 80% correct
- e. 1 66.7% correct
- f. 1 60% correct

IV. Incomplete Tests:
- 7 Participants did not complete test
- a. 1 100% correct out of 10 attempts
- b. 1 93.4% correct out of 10 attempts
- c. 1 66.7% correct out of 10 attempts
- d. 2 100% correct out of 5 attempts
- e. 1 100% correct out of 3 attempts
- f. 1 0% correct out of 3 attempts

V. Method Used to Identify the Bills:
- a. 34 Total number of individuals that used braille template when testing
- b. 27 Total number of individuals that did not use braille template when testing

VI. Survey Participant Reccomendations:
- a. 56 Individuals stated approval of this method for identifying currency
- b. 5 Individuals stated disapproval of this method for identifying currency

Personal Approval Ratings



★★ United States Currency Accessibility Act of 1994 ★★

J.F. Oschwald/Cherie Hendricks
5990 Richmond Hwy. Suite 1209
Alexandria, VA 22303 (703) 960-1559

The enclosed short video tape introduces a problem that faces approximately 3 million blind and visually impaired U.S. citizens almost daily. A way to distinguish between the denominations of our U.S. paper currency is presently impossible for the blind.

This tape explains the problem, gives a history of what has been done in the past by the government, and outlines a proposed possible solution researched and developed by a consensus of people.

The proposed solution was formally endorsed by the American Council of the Blind in July, 1992, at their national convention in Phoenix, AZ. Of 310 visually impaired persons who tested the idea, 307 endorsed it as a simple, economical and logical solution. The test responses in the video are totally spontaneous and unrehearsed. Please note that all test bills used were one dollar bills perforated in the appropriate location and marked accordingly to represent $1, $5, $10, $20, $50, and $100 bills.

In addition to being an effective, inexpensive solution, a close contact with the Bureau of Engraving and Printing has assured us that modifications to current equipment used to print currency would be within the cost effective guidelines set in the 1983 research, as indicated on the tape.

Please review the tape and help implement a solution to this problem. This solution may not be final; however, someone has to take steps to direct the Treasury Department to solve this dilemma. The research completed in 1983 gave credibility to the problem, but since then, little attention has been given to a solution by governmental agencies. This is why a group of very concerned citizens have developed and offered this solution. Acting upon legislation, the Treasury Department can make U.S. currency tactually identifiable to the visually impaired within a certain time frame-- making our money accessible to everyone.

We appreciate your time, would like to hear your thoughts and comments, and look forward to working with you in the near future.

With Kindest Regards,

J.F. Oschwald Cherie Hendricks

J.F. Oschwald Cherie Hendricks

RESOLUTION 92-02

TACTILE IDENTIFICATION OF CURRENCY

WHEREAS, currency is used by virtually everyone in everyday life including blind and visually impaired persons; and

WHEREAS, the currency of the United States is, at the current time, impossible to identify without vision or electronic device; and

WHEREAS, most blind and visually impaired persons are therefore required to rely upon others to determine denominations of such currency; and

WHEREAS, this constitutes a serious impediment to independence in everyday living; and

WHEREAS, electronic means of bill identification will always have more potential for fallibility than purely tactile means; and

WHEREAS, readily identifiable currency is consistent with the spirit of the Americans with Disabilities Act; and

WHEREAS, a suitable method of tactile identification utilizing a template with raised dots and a hole punched in an appropriate place on each bill according to denomination has been successfully field tested at the 1992 Convention of the American Council of the Blind; and

WHEREAS, such a system, if proven successful, could well be more cost effective, affordable and easily learned;

NOW, THEREFORE, BE IT RESOLVED, by the American Council of the Blind, in convention assembled at Phoenix, Arizona, this 9th day of July, 1992, that this organization strongly support efforts to make the currency of the United States tactually identifiable within a reasonable period of time; and

BE IT FURTHER RESOLVED, that ACB urge the Department of the Treasury to immediately engage in testing to determine whether such a system would be feasible; and

BE IT FURTHER RESOLVED, that the officers and staff of this organization be instructed to work closely with the Office of the Secret Service, Department of the Treasury, Bureau of Engraving and Printing, and appropriate Congressional committees to conduct such testing and to work toward implementation of a system of tactually identifiable currency; and

BE IT FURTHER RESOLVED, that copies of this resolution be sent to the Director of the Secret Service, Secretary of the Treasury, and appropriate members of Congress.

Adopted.

Patricia Price, Secretary

RESOLUTION

TACTILE IDENTIFICATION OF CURRENCY

WHEREAS, currency is used by virtually everyone in everyday life including blind and visual impaired persons, AND

WHEREAS, the currency of the United States is, at the present time, impossible to identify without vision or electric device, AND

WHEREAS, most blind and visually impaired persons are therefore required to rely upon others to determine denominations of such currency, AND

WHEREAS, this constitutes a serious impediment to independence in everyday living, AND

WHEREAS, electronic means of bill identification will always have more potential for fallibility than purely tactile means, AND

WHEREAS, readily identifiable currency is consistent with the spirit of the Americans with Disabilities Act, AND

WHEREAS, a suitable method of tactile identification utilizing a template with raised dots and a hole punched in an appropriate place on each bill according to denomination has been successfully field tested, AND

WHEREAS, such a system, if proven successful, could well be more cost effective, affordable and easily learned,

THEREFORE BE IT RESOLVED, by the Blinded Veterans Association Board of Directors at the Midwinter meeting, March 17-19, 1994, that this association strongly support efforts to make currency of the United States tactually identifiable within a reasonable period of time, AND

BE IT FURTHER RESOLVED, that Blinded Veterans Association urge the Department of the Treasury to immediately engage in testing to determine whether such a system would be feasible.

Resolution 92-01

Whereas money is used by virtually everyone in everyday life, and

Whereas the blind and visually impaired citizens must use currency, just as other citizens must, and

Whereas currency is, at the present time, impossible to identify without vision or an electronic device, and

Whereas many blind and visually impaired individuals are unemployed or earn below the poverty level and cannot afford electronic devices, and

Whereas most blind and visually impaired persons are frequently required to rely upon others to determine denominations of currency, and

Whereas this constitutes a serious curtailment of independence in everyday living, and

Whereas the Americans with Disabilities Act requires that the government shall provide equal access to all government services and publications, currency being one of these, and

Whereas a suitable method of tactual identification, using a template with raised dots and a hole punched in an appropriate place on each bill according to denomination, has been successfully field tested among numerous blind and visually impaired persons

Now Therefore Be It Resolved by the Louisiana Council of the Blind, Inc., in convention assembled on this 16th day of May, 1992 that this organization urges the Louisiana Congressional delegation to introduce and support legislation in the Congress of the United States which would require the Bureau of Engraving in the Department of the Treasury to take such measures as are necessary to make the currency of the United States tactually identifiable beginning in the year 1995, and

Resolved that copies of this resolution be sent to each Congressman and United States Senator from Louisiana and other appropriate persons, organizations and agencies.

Martha Hern

Martha Hern, President
Louisiana Council of the Blind, Inc.

Regular Session, 1992 ENROLLED

HOUSE CONCURRENT RESOLUTION NO. 13

BY REPRESENTATIVE JACK SMITH

A CONCURRENT RESOLUTION

To memorialize the Congress of the United States to direct to the Department of the Treasury and all other appropriate federal agencies responsible for the production of U.S. currency to provide identification on such currency which would enable people with visual impairment to distinguish between the various denominations by the year 1995.

WHEREAS, more than one and one-half million United States citizens who are visually impaired currently have no way of distinguishing between the various denominations of U.S. currency; and

WHEREAS, the results of an extensive 1983 study by the U.S. Department of the Treasury, Bureau of Engraving, the Secret Service, and the American Council for the Blind reported that there is a tremendous need to address the issue of currency identification for people with visual impairment; and

WHEREAS, to this date there has been no significant progress by the U.S. government toward putting in place a system which would enable people with visual impairment to identify U.S. currency; and

WHEREAS, with the recent passage of the Americans with Disabilities Act, congress has again reaffirmed the right of people with disabilities not to be discriminated against, but at the same time has taken no steps to end the discrimination by the U.S. government toward people with visual impairment in the matter of currency; and

H.C.R. NO. 13

WHEREAS, J.P. Oechvald, of Morgan City, Louisiana, has developed a proposal which calls for six specific locations for one five-point star within one quadrant of a bill that would provide a process for denomination identification for people with visual impairment; and

WHEREAS, Mr. Oechvald has consulted with people with visual impairment, the United States Mint, Congressman Billy Tauzin, Senator J. Bennett Johnston and received an audience at the White House in relation to his proposal.

THEREFORE, BE IT RESOLVED that the Legislature of Louisiana does hereby memorialize the Congress of the United States to direct the Department of the Treasury and all other agencies responsible for the production of United States currency to implement a procedure which would provide identification of the various denominations of U.S. currency to people with visual impairment by the year 1995.

SPEAKER OF THE HOUSE OF REPRESENTATIVES

PRESIDENT OF THE SENATE

Passed in Regular Session, 1992

Write to each Senator at:
Senator's Name
Senate Building
Washington, DC 20510

State	Senator	Liaison(s)
FL	Connie Mack	Mark H. Smith
MN	Paul Wellstone	Roberta Levy/ Ellen Shaffer
CO	Hank Brown	Joseph Rogers
NC	Laugh Faircloth	Thomas Roddis
HI	Dan Inouge	Kieth Grouvera/ Marie Blanco
NY	Al D'Amato	Roger Panetta/ Scott Amilini
LA	John Breaux	Celeste Coco
CO	Ben N. Cambell	Mark Ingman
DE	William Roth	Gioia Bonmartini
NM	Jeff Bingman	Billy Carrie/ David Thornson
CA	Barbara Boxer	Alan Thomas/ Michele Jolin
NE	J. Robert Kerrey	Kathryn Coleman/ Philip Ross
AZ	Dennis DeConcini	Matt Collins
WA	Patty Murry	Helen Howell
IN	Tom Harkin	Subcommittee on Disability Policy
TN	Jim Sasser	Amy Kestnbaum
VE	James Jeffords	William Testerman
VT	Robert Bennett	Robert C. Cresanti
MO	Christopher Boud	Chuck Parkinson
OH	Howard Metzenbaum	Michele Varnbagen
MN	Dave Durenberger	Susan Hugaard/ Katherine Friess
CT	Christopher Dodd	Michael Stein, Marti Cochran
NV	Richard Bryan	Andy Vermilge
MA	John Kerry	Vonation Winer
NM	Pete Domenici	Denise Rameras
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TX	Phil Graham	Wayne A. Abernathy
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MD	Paul Sarbanes	Marty Gruenberg/ Julie Kehali
WV	Robert Byrd	Kathy McNally
MO	Barbara Mikulski	John M. Lewis
MI	Donald Riegle	Sarah Baily/ Kevin Avery
AL	Richard Shelby	Christian Gevhan
VT	Oran Hatch	Kris Iverson
LA	Rep. Billy Tauzin	Dona Boise

U.S. HOUSE OF REPRESENTATIVES

*Committee on Banking, Finance and Urban Affairs

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NJ	Donald M. Payne	Patricia Crawford
VA	Robert C. Scott	Carlton Green
		Charles Vernon
OH	Thomas C. Sawyer	Bill Eldredge
NC	Cass Ballanger	Ashley M. Rehr
NE	Bill Barrett	Jeri Finke
IL	Harris W. Fawell	Robert J. Green

*Colorado Delegation

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CO	Scott McInnis	Ann Benson
CO	Dan Schaefer	Jeffrey Weist
CO	Patricia Schroeder	--
CO	Joe Hefley	Brian Reardon

*Louisiana Delegation

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LA	William Jefferson	--
LA	Jim McCrery	Scott V. Nystrom

*Others

FL	Pete Peterson	Barbara E. Soltes
PA	Paul McHale	J. Lee Norman, Jr.
NE	James H. Bilbrey	David E. Goldwater

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102D CONGRESS
1ST SESSION

H. R. 2160

To require the Board of Governors of the Federal Reserve System to develop a design for Federal Reserve notes in the denominations of $5, $10, $20, $50, and $100, and a method for producing such notes, that includes the designation of the denomination in braille on the face of the notes.

IN THE HOUSE OF REPRESENTATIVES

MAY 1, 1991

Mr. KOLTER introduced the following bill; which was referred to the Committee on Banking, Finance and Urban Affairs

---

A BILL

To require the Board of Governors of the Federal Reserve System to develop a design for Federal Reserve notes in the denominations of $5, $10, $20, $50, and $100, and a method for producing such notes, that includes the designation of the denomination in braille on the face of the notes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Braille Designated Currency Act".

SEC. 2. FEDERAL RESERVE NOTES REQUIRED TO INCLUDE DESIGNATION OF DENOMINATION IN BRAILLE.

(a) DESIGN REQUIRED.—The Board of Governors of the Federal Reserve System shall develop a design for Federal Reserve notes in the denominations of $5, $10, $20, $50, and $100, and a method for producing such notes, that includes the designation of the denomination of such notes in braille on the face of the notes.

(b) IMPLEMENTATION.—All Federal Reserve notes in the denominations of $5, $10, $20, $50, and $100 which are issued after the end of the 1-year period beginning on the date of the enactment of this Act shall contain the designation of the denomination of such notes in braille.

O

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